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Royal Botanic Gardens
Melbourne

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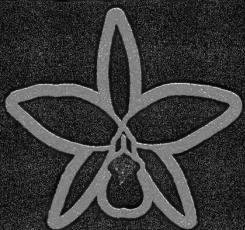
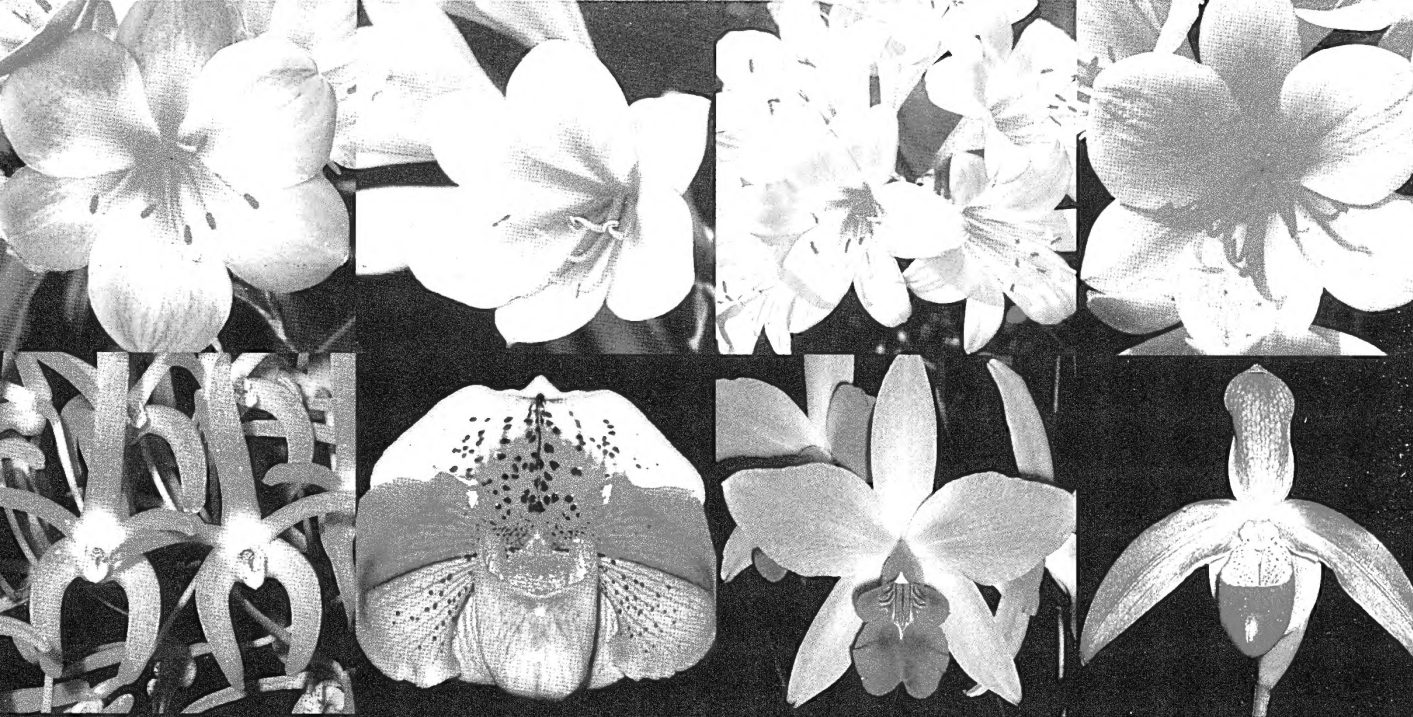
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From the Editor's Desk

It is great to see the return of contributions from Cymbidiums from Graham Guest who manages the wholesale nursery Guest Orchids in Adelaide, South Australia. In this issue Graham discusses many of the newer colourful hybrids derived from the species *Cymbidium devonianum*. Graham has been collaborating with Andy Easton of New Horizon Orchids.

There is a heavy Australian Native Orchid flavour in this issue. Some of this has been prompted by the publication of the 2014 volume of *Genera Orchidacearum* Vol. 6, which deals with the major Australian genera of *Dendrobium*, *Bulbophyllum* and *Sarcophilus* and its relatives. This issue covers two major articles (one as an extended and detailed book review) dealing with the genus *Dendrobium* in an Australian context, yet the philosophy applies to the genus as a whole. Too often we hear outlandish statements, without any evidence, saying that *Dendrobium* is just a large and varied genus. Fact is, few know what a real *Dendrobium* is, or what defines the genus. What we also see throughout *Genera Orchidacearum* are major inconsistencies in how the various world orchid genera are treated, on a global scale. Many genera have been split up, yet *Dendrobium* and *Bulbophyllum* have clearly been placed in the "too-hard basket".

Many readers will only have a passing interest in the scientific naming of orchids. Hopefully these articles will provide a reasoned argument against many of the proposals impacting on our own indigenous orchids. Have a look at the photos accompanying these notes; do YOU think all these varied and dissimilar orchids belong in the genus *Dendrobium*? *Dendrobium nobile* is an example of a "true" *Dendrobium*, as are all the "Softcane" hybrids derived from this and similar species. *Dendrobium moniliforme* is the Type species of the genus.

What characters are being used that keep *Sarcophilus* together at genus level? Then we show images of nine very similar orchids – closely related to *Sarcophilus* – all members of Subtribe Aeridinae (formally Sarcanthinae) but ALL are in separate genera, with many monotypic (only one species in the genus). So where is the consistency? Too many sheep blindly just follow the Kew Monocot Checklist.

I was quite surprised to see the President of the Australian Orchid Council, Jim Shaughnessy, publically weighing in, about a year ago in *Orchids Australia*, promoting a negative action to support Ian Chalmers being made a Fellow of the AOC. By saying: "Ian has done an enormous amount of work in preventing unnecessary changes to the nomenclature of Australian Native Orchids". That is an irresponsible bias comment, made without any facts to back up his statement. Surely Jim would have been better to have focussed on positives, such as Ian's ongoing administrative roles as OSNSW Judging Registrar for over 20 years and his contributions on OSNSW Management Committee for over three decades. As Jim and Ian are hardworking orchid administrators; not scientists, botanists, or trained in nomenclature and plant systematics. They simply do not have the skills required or the extensive technical background or knowledge to satisfactorily advise on what orchid names should or should not be used (in Australia for shows and awards).

Congratulations to respected CSIRO orchid scientist Dr. Mark Clements who was recently presented with the prestigious Westonbirt Orchid Medal in London. Now here is someone who is ahead of his time and really knows Australian orchids...

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Cover Shot

Cymbidium

Pearl Dawson 'Royale'

– an outstanding hybrid derived from targeted breeding using *Cymbidium devonianum*.

(Photo: David Banks)





Cymbidium devonianum
'Paradisia'
(DPB)

Cymbidium devonianum - The Devon made me do it

by Graham Guest, Guest Orchids

Of the 50 plus *Cymbidium* species, *Cymbidium devonianum* ranks as one of the most prolific in hybrids. This short article provides a snapshot of modern hybridising. We will take you back to the early days and into the future where we believe the influence of this alluring species will continue to spark interest.

A cool Asian Species. Endemic to Nepal, India, across to Thailand and Vietnam, its natural habitat and microclimate is beautifully captured in the *in situ* picture. Those luscious dark green leaves are indicative of a plant growing at its optimum, absorbing dappled light under a canopy suitable for ferns. Situated on a tree, the plant has greater opportunity to draw cool air and moisture from the misty air. You can bet the water is pure, with minimal salts.

An epiphytic orchid, *C. devonianum* uses the host tree for mechanical support – closer inspection reveals the trunk is covered with lichens, suggesting a thin but dense material in which the orchid's roots are entwined. An important consideration, suggesting the free draining open mix often adopted by hobbyists may need reconsideration to achieve optimal plant growth.

Some History

In the 1800's Europe's wealthy aristocrats allocated vast sums to finance Orchid Hunters to scour the Americas and Asia in the hope of discovering rare new species. The motivation? Some were botanists, interested in these plants from a scientific purpose, and others fortune hunters, commercial aspirations first and foremost. Three names stand out from the period; British based German Frederick Sander, the original Orchid King, Belgian Jean Linden, and English Botanist John Lindley.



Cymbidium devonianum
- epiphytic plant *in situ*



© New Horizon Orchids

From amongst the thousands of plants shipped to Europe, some survived. The first person to flower what we now classify as *Cymbidium devonianum* was the Duke of Devonshire in 1843. It was nearly 70 years later before the earliest hybrid appeared, made by Veitch in 1911, *C. Langleyense* a primary with *C. lowianum*. The year 1911 just also happened to be the registration of *C. Alexanderi*, and with it the first known tetraploid. Understandably this line was the flavour of the decade, and miniatures like *C. devonianum* tended to be relegated as afterthoughts. Like a fine wine, it took a master hybridiser to recognise its qualities and value.

The Hybridisers

In 1965, Keith Andrew visited India to research the habitat of a plant that had fascinated him, *C. devonianum*. He travelled with a fellow orchid specialist Brian Rittershausen. The Holy Grail at that time was to breed an elusive blue orchid, and Keith was seeking new species which might help attain this seemingly impossible goal. Armed with the philosophy of 'being able to see beyond what you are looking at', Keith from a small nursery in Dorset, perhaps fell short in the blue stakes, but his *C. devonianum* hybrids became the buzz of the orchid world in the 1970's, breeding some of the world's finest *Cymbidium* hybrids, and leaving a wonderful legacy for future generations.

As a young enthusiast, Keith Andrew was aware of the legendary hybridiser and grower to Sir George Holford, H.G. Alexander, who lived at the nearby Westonbirt Estate. Keith borrowed a bicycle and cycled seven miles to meet the great man - the one responsible for arguably the greatest *Cymbidium* hybrid of all time, *C. Alexanderi* 'Westonbirt'. He was well rewarded - on leaving at the end of the day;

H.G. Alexander shook his hand, wished him well in his career, and offered assistance as and when required. What advice he garnered was obviously of great value, and Keith Andrew began winning medals from 1972, and distinguished himself by exhibiting at Chelsea for a 22 year stretch. The RHS has recognised his achievements and awarded him their prestigious Gold Veitch Memorial Medal. As testament to a lifetime's work, his plants are still cloned to this day, with *C. Bulbarrow* cultivars, 'Friar Tuck', 'Maid Marion' & 'Will Stutley' often seen in listings. It was over 20 years ago Keith stated 'it is a brave hybridiser who would return to the species, at a time when increasing roundness in flower form is paramount for Shows and Awards.'

But that is the essential difference between breeder and hybridiser. The former seeking a quick return, the latter seeking to build a gene pool in search of long term results. That approach served Keith well, culminating with Champion at the Santa Barbara Orchid Show with a cut spike of *C. Devon Lord 'Viceroy'*.

For a 30 year period from 1962, Keith made 50 crosses with *C. devonianum*, 30 as a pollen parent, all successful. Conversely, as a pod parent, only 5 were able to successfully raise seed, and of those only one was a primary, *C. Devon Odyssey*. Baron Keith Andrew, "King of devonianums", as he became known, made such beauties as *C. Vivien Hainsworth*, *C. Olive Street*, *C. Cariat*, *C. Plush Canyon*, *C. Flame Hawk*, *C. Brook Street*, *C. Kalimpong*, *C. Small Talk*, *C. Penny Lane*, and *C. Zaskar*.

Just as Keith Andrew had dialogue with H.G. Alexander, Kiwi, Andrew Easton, as a youth, sought wisdom from Keith Andrew. In those days, some of Easton's letters were eight pages long! The contact continued on a regular basis, such was his interest in learning from a master hybridiser, and even today they still discuss hybridising via telephone.

Easton gathered a vast gene pool from *C. devonianum* breeding, with the goal of converting both species and selected hybrids into tetraploid forms. This heralded a quantum step in stunning pendulous cymbidiums such as *C. Last Tango*, *C. Devon Odyssey*, *C. Gala Odyssey*, *C. Devon Elf*, *C. Devon Railway*, *C. Devon Shell*, *C. Pearl Dawson*, *C. Phar Lap*, *C. Mem Amelia Earhart*, *C. Magic Devon*, *C. Pacific Sparkle*, *C. Neal Tadlock*, *C. Uncle Everett* and *C. Dorothy Stockstill*. Many of these parents have forged on to the next generation, with outstanding results coming to fruition. Some of these are pictured in this article.



Cymbidium devonianum
'Rachael'
wild example
from India
(DPB)



Cymbidium devonianum
- showing form from
India (L) & Vietnam (R)

Adelaide Breeding

At Guest Orchids, our primary business is wholesale pot plant production, so our breeding program endeavours to meet the premium quality requirements of our customers. Since our flowering plants are shipped interstate, upright spikes are essential. When we first flowered *C. Last Tango* 'Geyserland' in the 1990's, we were seduced by its rich chocolate colour. We set about breeding an upright spiking *C. Last Tango*. Such an endeavour can take multiple steps.

First step, we produced *C. Cole Stockstill*, a cross of *C. Uncle Everett* with *C. Jessie Blakiston*, the pollen plant we knew being dominant for upright spikes. Next cross was to cement that rich chocolate colour, and reinforce the upright spiking habit. We were successful with *C. Black Betty* (6.25% *devonianum*), crossed with the standard, *C. Shocking*. The plant produces upright spikes that do not require staking.



Cymbidium
Bulburrow
'Friar Tuck'
(DPB)

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Harding, Patricia A. 2008

In this first book devoted to the *Huntleya* alliance, the author combines the results of recent molecular data with historical records and first-hand growing experience to provide all the known essentials for an upcoming group of orchid species.

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Summary

In summary, Englishman Keith Andrew and more recently New Zealand born Andrew Easton (formerly Geyserland Orchids, now New Horizon Orchids) have been major forces in the development of the *C. devonianum* pendulous style. As Easton predicted, new types in a range of clear colours (as well as spotted and pelorics) have come to fruition. In addition flowering for these pendulous hybrids is gradually extending to earlier and later in the season.

The following represent the finest of hybrids bred from *C. devonianum*. Over the next few years Australia will benefit from the next wave of tetraploid hybrids, flowers that will transform current standards. Exciting times indeed.

(Photographs by Andy Easton – New Horizon Orchids, David Banks and Graham Guest – Guest Orchids.)

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Guest Orchids

Adelaide, South Australia

Email: guestorchids@gmail.com



Cymbidium
Devon Odyssey
'Pink Panther'
(DPB)



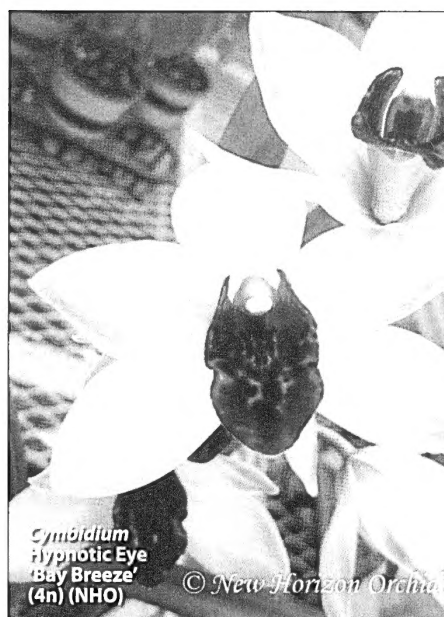
Cymbidium
Devon Parish
'New Horizon'
(4n) (NHO)

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Cymbidium
Gala Odyssey
'#1'
(4n) (NHO)

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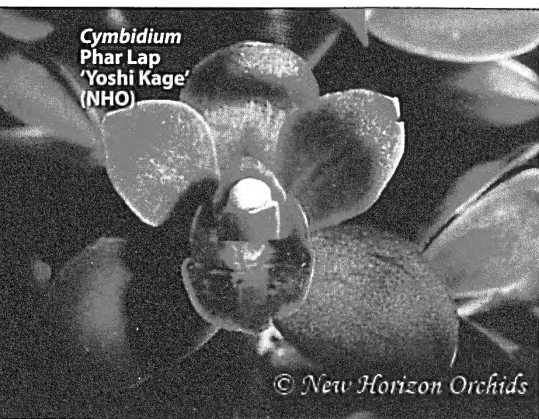
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Hypnotic Eye
'Bay Breeze'
(4n) (NHO)

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Cymbidium
Placido Domingo
'Dark Knight'
(4n) (NHO)

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Cymbidium
Phar Lap
'Yoshi Kage'
(NHO)

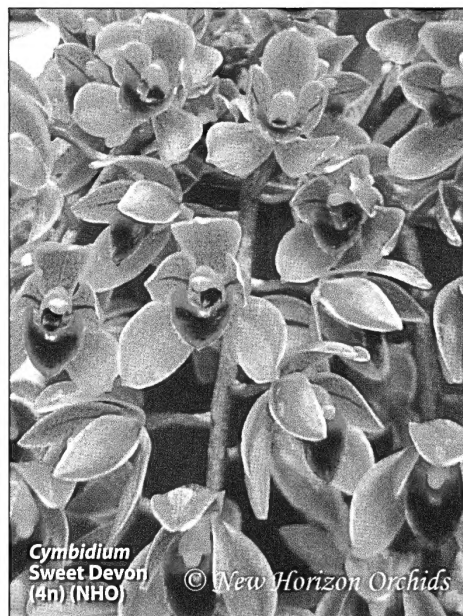
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Cymbidium
Dorothy Stockstill
'Forgotten Fruit'
(4n) (DPB)



Cymbidium
Plush Canyon
'Beenak'
(DPB)



Cymbidium
Sweet Devon
(4n) (NHO)

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Cymbidium
Lee Cooke
(4n) (NHO)

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Bermagui
'Kelly'
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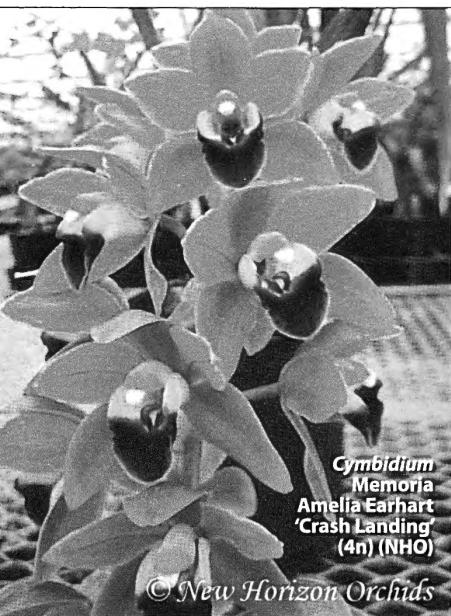


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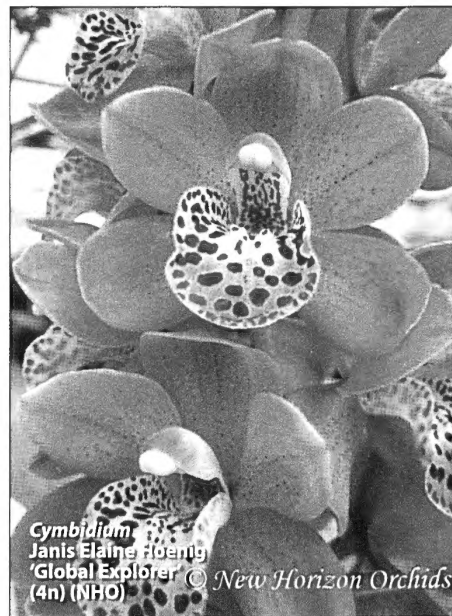
Cymbidium
Memoria
Amelia Earhart
'Crash Landing'
(4n) (NHO)

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Cymbidium
Janis Elaine Hoenig
'Sallinas'
(4n) (NHO)

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Cymbidium
Janis Elaine Hoenig
'Global Explorer'
(4n) (NHO)

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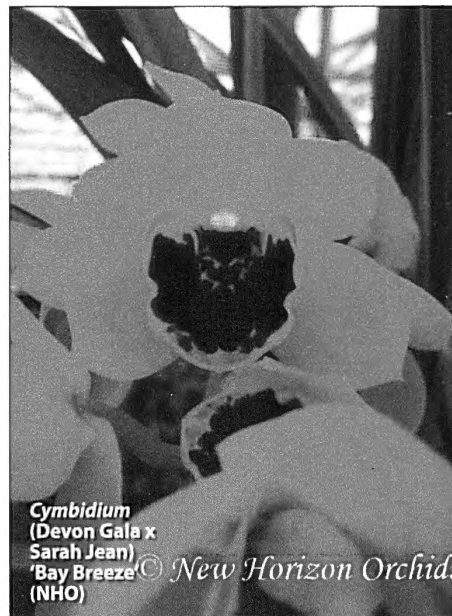
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Bayaka Pendant
'Green Globe'
(4n) (NHO)

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Cymbidium
Saigon Beauty
'Thu Ba'
(NHO)

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Cymbidium
(Devon Gala x
Sarah Jean)
'Bay Breeze'
(NHO)

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Cymbidium
Pearl Dawson
'Royale'
(4n) (DPB)



Cymbidium
Assassination
Tango
Fires of Spring
(4m) (NHO)

© New Horizon Orchids



Cymbidium
Current Day Boy
Green Lagoon
(1m) (NHO)

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Cymbidium
Black Betty
(5G)



Cymbidium
Last Tango
(DPB)



Cymbidium
Black Betty
(5G)



Cymbidium
Plácido Domingo
'Javier'
(NHO)



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Cymbidium
 (Pepperuss X
 Memoria Amella Earhart)
 'Thu B'
 (NHQ)



Cymbidium
 Alida Valli
 'Bellezza'
 (NHQ)



Cymbidium
 Janis Elaine Hosenly
 'Dot Rowe'
 (Rn) (NHQ)



Cymbidium
 Memoria Amella Earhart
 'NH'
 (Rn) (NHQ)



The OSCOV Melbourne Orchid Spectacular 2016

The Orchid Societies Council of Victoria (**OSCOV**) will be staging the OSCOV Melbourne Orchid Spectacular for the 23rd time in 2016.

The venue will again be KCC Park, 655 Westernport Highway, Skye, Victoria. KCC Park is an enormous Pavilion – and it needs to be, because the OSCOV Show is enormous!

There will again be around 25 orchid displays from OSCOV Member Societies, other orchid societies and other presenters.

We expect that again there will be around 25 commercial vendors with a variety of orchids and related merchandise.

The seminar program was a great success in 2015 – and in 2016 we plan to make a feature of this aspect of the event. There will be presentations on a range of orchid-related

topics, from repotting, to mounting, to deflasking, to specialist sessions on types of orchids such as Masdevallias, Australian Native Dendrobiums, Australian Terrestrial Orchids, *Sarcochilus*, Slipper Orchids, the *Cattleya* Alliance and many more.

Entry fees are very reasonable: \$10 for adults, \$9 for Seniors & \$8 for pre-approved groups of 7 or more persons. There will again be a Barista in the hall, positioned in the middle of the Photography & Art competition section.

The Mayor of the City of Frankston will be opening the Show in the early afternoon of Friday 26 August – the Mayor is a keen horticulturalist, and will no doubt be amazed by the number and variety of orchids on display and for sale.



Cymbidium hookerianum
"Droain"
-grown by John McMillan

The photographs accompanying this article have been taken by the author from previous OSCOV Shows – they showcase the quality and diversity of orchids you will see there. Because the OSCOV Show is the largest annual orchid show in the Southern Hemisphere, it is an event you cannot miss if you are an orchid enthusiast in, or near, Melbourne in late August. It's an event that should be in every orchid grower's diary – and 2016 promises to be the very best Spectacular yet.

Enquiries in relation to the OSCOV Show should be directed to either the Facebook page: <https://www.facebook.com/Melbourne-Orchid-Spectacular-164357086923002/> or the OSCOV Secretary, Alan Baker on 0413 599 368.

For completeness – the OSCOV Judging Panel decided the OSCOV Victorian Orchids of the Year for 2015 in late February. A number of the finalists could be seen at the OSCOV Show in 2015, and to see the overall winners, please visit: <http://www.oscov.asn.au/Oyear/year15.html> ■

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Esmeralda cathcartii
-grown by Michael Matthews



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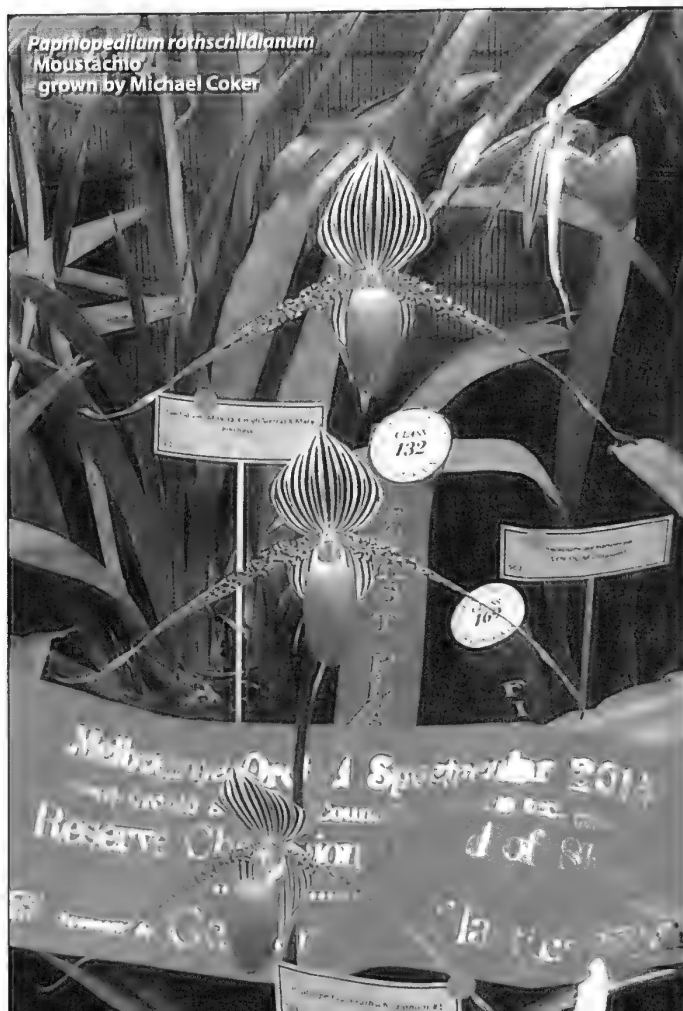
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- grown by Michael Simonetto



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Genera Orchidacearum (Volume 6) – A Response to These “New” Names

by Michael Harrison

Published in February 2014, *Genera Orchidacearum* Vol. 6 is the final volume in a series of technical publications dealing with the taxonomy of orchids. Volume 6 is of particular interest, as it deals with the major Australian genera of *Dendrobium*, *Bulbophyllum* and *Sarcochilus* and its relatives. In summary, the editors of *GO* Vol. 6 have proposed the maintenance of both *Dendrobium* (and *Bulbophyllum*) as genera in the broad, conservative sense. This would mean that a number of long-established genus names, including *Cadetia*, *Diplocaulobium*, *Dockrillia*, *Flickingeria* and *Grastidium* would be returned to the genus *Dendrobium*.

The science of orchid taxonomy is perhaps not of great interest to many growers, but the classification of our orchids goes to the very heart of the study of Australian orchids. At this point I should say that I am entering the debate from the position of a hobbyist with a lifelong interest in Australian orchids. I am not a scientist, and Australian orchids are a passionate interest, not a profession. Also, I have not seen *Genera Orchidacearum* Volume 6, and I am responding to the comments, explanations and opinions expressed by Peter B. Adams and Andre Schuiteman (*Orchadian* Vol.17 No.11: 496-505), and their clear endorsement of its contents.

The question of how best to classify the genus *Dendrobium*, or perhaps more accurately, how best to classify the Subtribe Dendrobiinae, has been ongoing for decades. Conventionally, *Dendrobium* has been considered a very large and diverse genus, into which have been placed a great number of species, with widely varying vegetative and floral features. Indeed, with something in excess of 1600 species in the genus, *Dendrobium* in the broad, conventional sense has been used essentially as a “catch-all” genus.

The genus was divided into numerous sections, with each section accommodating groups of species with obvious affinities based on floral and/or vegetative characters. In the case of some species, however, it was difficult to determine where best to place them, as they displayed apparently intermediate characters.

By the 1980's, with the beginnings of new diagnostic techniques and the advent of more progressive approaches to biological classification, some workers were becoming increasingly dissatisfied with *Dendrobium* in the broad sense.

However, because of the sheer number of species involved, and its wide geographic distribution, *Dendrobium* has been a challenge to review effectively in its entirety.

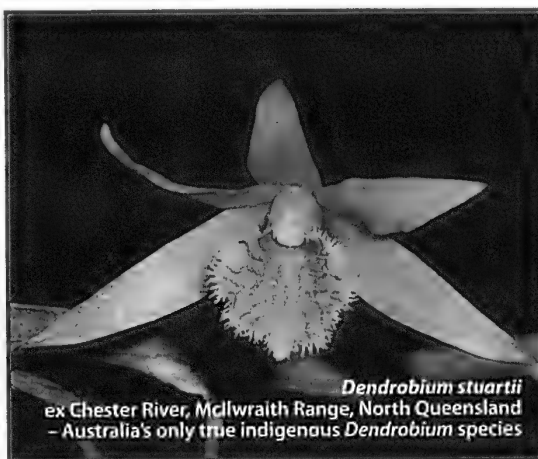
Much of the debate about classification hinges on the definitions that are used, as well as the ideologies of the individual taxonomists. One of the basic principles of classification is that a taxonomic rank should represent a monophyletic grouping of individuals at the next level below it. What this means, for example, is that all members of a genus should be descended from a single ancestral species immediately above them, or close to immediately above them, reflecting the radical evolutionary pattern that has occurred. As evolution is a process of divergence, our system

of classification should represent the evolutionary relationships involved. In short, it should be family tree of where a species fits and how it got there. As more evidence is acquired, the more precisely we can plot the evolutionary pathways of species, and the more accurate our family tree will become.

For our system of classification to work logically, a genus must be monophyletic, at least in principle, and based upon the available evidence. Of course, the process of speciation is ongoing, and it proceeds at varying rates in different species in different places. So, in practice, it is not as orderly and straight forward as

we might like it to be. What our system of classification attempts to do is to pigeon-hole species and groups of species into a useable and understandable framework. Generally, the system works well, but at times it may be unable to fully cope with the complex nature of the task. This does not mean the system is wrong, it just means that sometimes we have to bend things a little to make them fit, or compromise, until we are in a position to make a more informed decision about something.

With regard to *Genera Orchidacearum* Vol. 6, it would appear that in order to provide “orchid growers with a stable nomenclature”, the authors and contributors have decided to take the easy option with regards to *Dendrobium*, and to *Bulbophyllum* as well. In a way, this is understandable, as these genera are unwieldy and difficult to fully comprehend, and meaningful reviews would be difficult and time-consuming to achieve.



Dendrobium stuartii
ex Chester River, McIlwraith Range, North Queensland
– Australia's only true indigenous *Dendrobium* species

I am sure that the decision to maintain these genera in the broad sense allows the authors to feel they have settled the debate, and the publishers to complete the series. But in effect, the approach they have taken is to put *Dendrobium* and *Bulbophyllum* into the “too hard” basket. I believe this is a short-sighted policy which will not settle the issue, even into the near future. *Dendrobium* in the broad sense is just too large and diverse a group of species to be taxonomically useful. To maintain any genus with well over a thousand species is untenable, and such a treatment disregards the generic concept of a group of closely related species.

For example, I cannot be convinced that *D. discolor* and *D. lichenastrum* belong in the same genus. To lump these two species into the same genus is to imply that they share a common immediate ancestor, and such an assertion is unsustainable. Do *D. tetragonum* and *D. malbrownii* belong in the same genus, or do *D. smillieae* and *D. agrostophyllum* belong in the same genus. I think not. There are a multitude of examples I could use.

The simple and undeniable fact is that if you can divide *Dendrobium* at a subgenus level into various sections, then you can just as easily recognise these sections as genera. This is a logical approach which results in a more meaningful system, as it reflects more accurately the relationships between species and groups of species. And yes, there are some problematic species that do not seem to fit snugly into one genus or another, but this is true either way.

Of course, genus *Dockrillia*, the group of fleshy leafed, pendulous species, lacking pseudobulbs, and with non-resupinate flowers, may not be as taxonomically neat and tidy a collection of species as we might like, but it still makes sense to use *Dockrillia*, rather than to lump them in with 1600 vastly dissimilar species, and say they are all *Dendrobiums*. Likewise, genus *Grastidium* is an identifiable group, with continuously growing, slender stems, grassy foliage, and short-lived flowers borne in pairs. These features unite these species, and distinguish them from members of other groups. This is a logical genus, so why not use *Grastidium*. Indeed, a great many of the sections within *Dendrobium* broadly, actually represent genera, and should be treated as such. And, to abandon long established and commonly accepted genera such as *Cadetia*, *Diplocaulobium* and *Flickingeria* is a seriously retrograde step.

To push the point further, Adams and Schuiteman state that Sections *Dendrocoryne* and *Latouria*, although closely related, can be distinguished from one another by “details of the flowers”. This being the case, why should we not recognise these sections as genera?

The problem, I am sure, is twofold. Firstly, if we do decide to recognise these groups or sections as separate genera, then we logically end up with dozens of new genera in the place of one. This may be challenging to come to terms with in the short term, but surely not too much of a hurdle. But secondly, and probably more importantly, the mindset of the authors would appear to be biased towards a philosophically conservative approach, at least in the case of *Dendrobium* and *Bulbophyllum*.

Strangely, members of Subtribe Aerdinae (formally Sarcanthinae) are handled differently, and this points to a serious inconsistency in taxonomic treatment. Adams and Schuiteman state that “all of the Australian genera have clear specific identifying morphological characters supporting them”. Why are all the segregate genera in this subtribe

accepted, whilst in Subtribe Dendrobiinae everything is lumped back into *Dendrobium*? If *Sarcochilus* is a good genus, with something in the order of around 20 species, then why is *Dockrillia*, with around 30 species, unacceptable? And why are all the small genera such as *Drymoanthus*, *Mobilabium*, *Papillilabium*, *Peristeranthus*, *Plectorrhiza*, *Schistotylus*, etc., with just one or a few species, all accepted? Why weren't they all lumped together in the same way as their treatment of *Dendrobium*? Are all the Australian *Sarcochilus* closely related or do some belong in other genera? Adams and Schuiteman state that the Australian genera “are separated mainly on obscure details” of floral morphology, “yet experienced growers have no trouble recognising them at first glance.” Their vegetative characters are very, very similar, a complete contrast to the highly variable growth forms within *Dendrobium* in the broad sense. A similar but even stronger argument is just as applicable to the *Dendrobiums*, as here the differences in floral morphology between the segregate genera are hardly obscure. Their treatment of these Australian orchids seriously lacks botanical and scientific consistency.

Adams and Schuiteman stress the importance of recent molecular studies in the taxonomic decisions reached in *Genera Orchidacearum*. It would seem molecular studies can be used to justify differing taxonomic conclusions, depending on the philosophical views of a particular author or consortium. In *Genera Orchidacearum* Vol. 6, we have DNA results being used to support the maintenance of *Dendrobium* as a broad genus of 1600 plus species, whilst in the not too distant past, there were other research botanists using the same kinds of studies to split *Dendrobium* into numerous genera. Who is right? The short answer is that there is no absolute right or wrong, just different ways of interpreting the data. But, any interpretation that is so broad as to place, say, *Dockrillia pugioniformis* and *Dendrobium bigibbum* into the same genus is misguided, and is ignoring the concept of what a genus should represent.

It would have been preferable to have seen *Dendrobium* and *Bulbophyllum* left unresolved and as “taxa needing additional work”, as Adams and Schuiteman list, in part, as one of the aims of *Genera Orchidacearum*. I believe these two genera, in the broad sense, cannot and will not stand the test of time, and that eventually the authors and their proponents will be shown to have been on the wrong side of history.

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Editor's Note: This article was originally submitted for publication in *The Orchadian*, the quarterly journal of the Australasian Native Orchid Society (ANOS), as a response to “*Genera Orchidacearum* Volume 6 and Australian Orchids” by Peter B. Adams and Andre Schuiteman in the March 2014 issue 17(11):496-505, but it was rejected by the editor Greg Steenbeeke and his editorial committee, that included Peter Adams. It has since been amended slightly for the *Australian Orchid Review*. **DPB**



(*Dendrobium bigibbum* var. *superbum*)
- *Vappodes phalaenopsis*



(*Dendrobium discolor*)
- *Durabaculum undulatum*



(*Dendrobium unilicatum*)
- *Cephaelanthus tatarifolius*



(*Dendrobium taylori*)
- *Cadetia taylori*



(*Dendrobium glabrum*)
- *Diplocaulobium glabrum*



(*Dendrobium comatum*)
- *Flickingeria comata*



(*Dendrobium cancrioides*)
- *Grastidium cancrioides*



(*Dendrobium lutescens*)
- *Grastidium lutescens*



(*Dendrobium malbrownii*)
- *Monanthos malbrownii*



(*Dendrobium agrostophyllum*)
- *Trachyrhizum agrostophyllum*



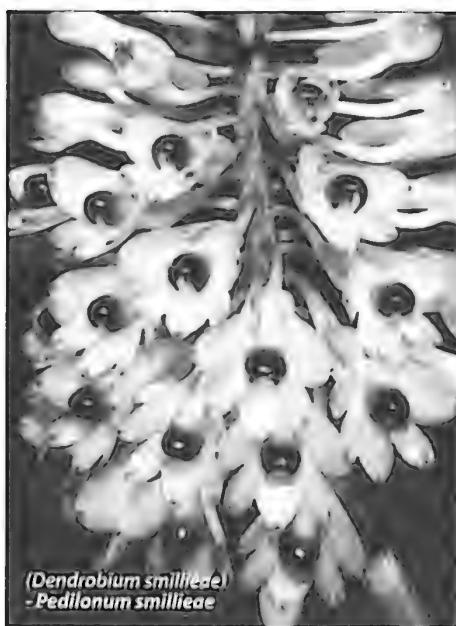
(*Dendrobium tetragonum*)
- *Tetrabaculum tetragonum*



(*Dendrobium jonesii* subsp. *magnificum*)
- *Trichychiton jonesii*



(*Dendrobium carrii*)
- *Australorchis carrii*



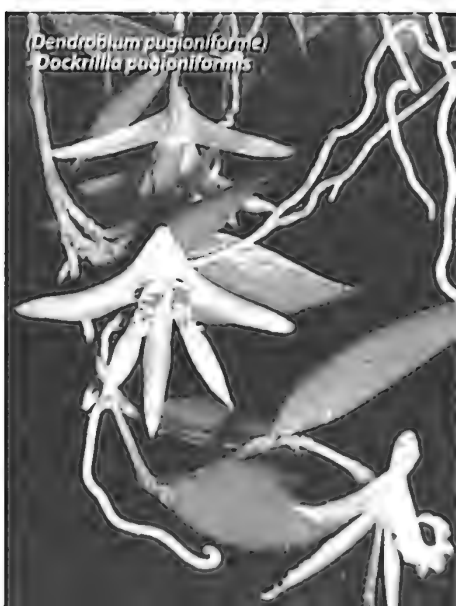
(*Dendrobium smileiae*)
- *Pedilonum smileiae*



(*Dendrobium leucostictum*)
- *Leucophaea leucosticta*



(*Dendrobium wassellii*)
- *Dockrillia wassellii*



(*Dendrobium pugioniforme*)
- *Dockrillia pugioniformis*



(*Dendrobium cucumerinum*)
- *Dockrillia cucumerina*



Sarcophilus falcatus



Sarcophilus weinthalii



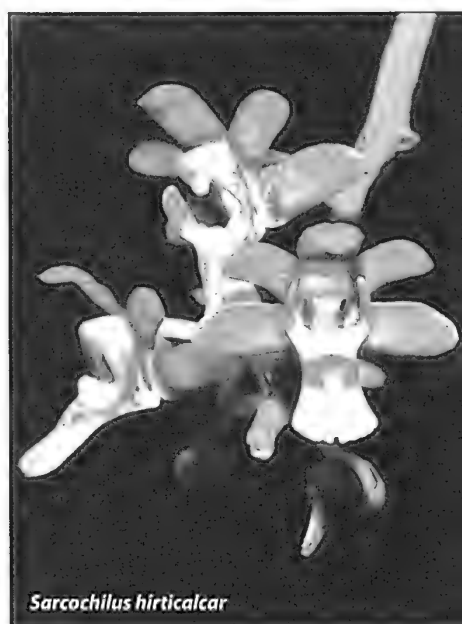
Sarcophilus aequalis



Sarcophilus hartmannii



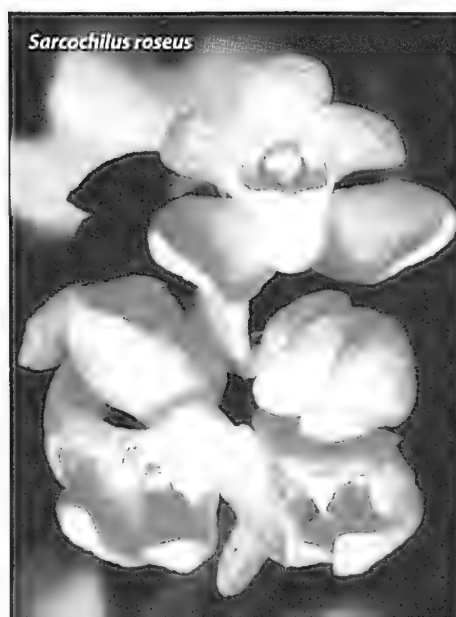
Sarcophilus fitzgeraldii



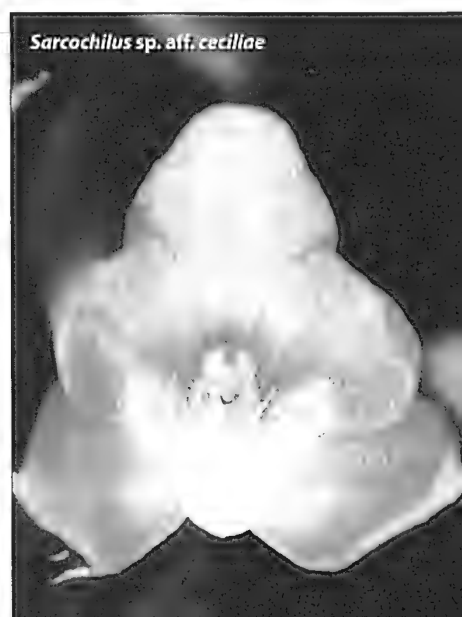
Sarcophilus hirticalcar



Sarcophilus ceciliae (L)
& *Sarcophilus* (R)



Sarcophilus roseus



Sarcophilus sp. aff. *ceciliae*



Sarcophilus hillii



Sarcophilus tricallosus



Sarcophilus sp. "Wide Bay"



Sarcophilus australis



Sarcophilus spathulatus



Sarcophilus dilatatus



Sarcophilus serrulatus



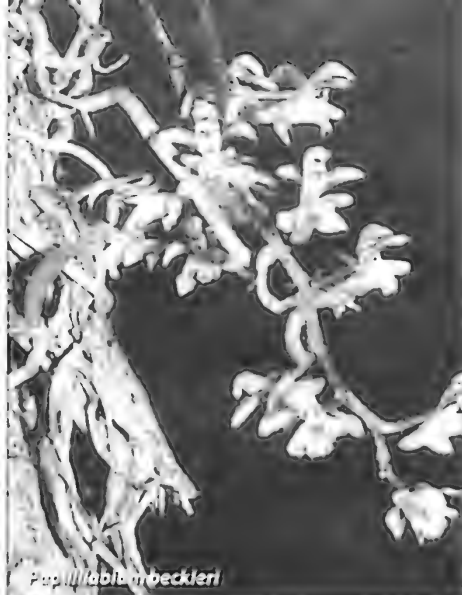
Sarcophilus olivaceus



Sarcophilus parviflorus



Plectorrhiza undulata



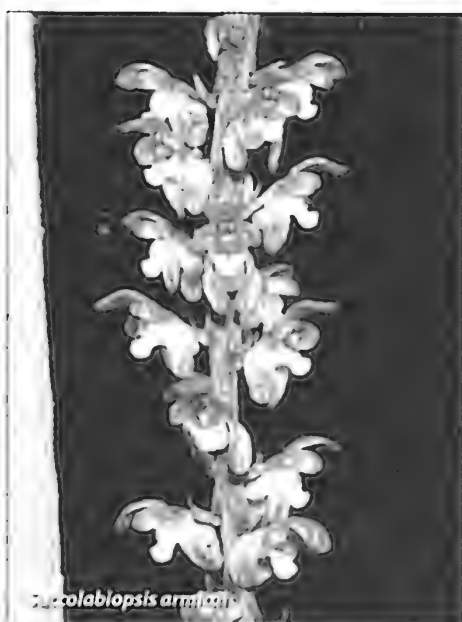
Papillilabium beckleri



Schistotylus purpuratus



Mobilabium hamatum



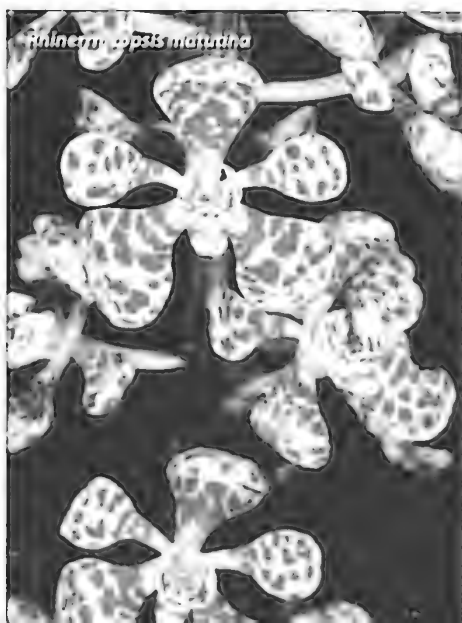
Psicolabopsis armata



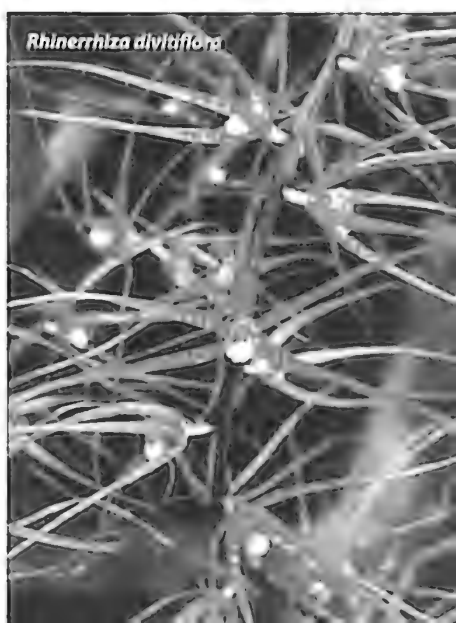
Peristeranthus hillii



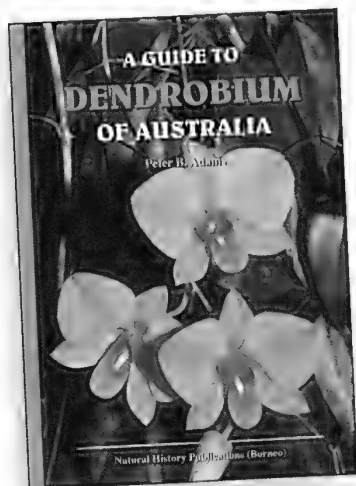
Pomatocalpa macphersonii



Rhinerrhiza leptostachya



Rhinerrhiza divitiflora



A Guide to *Dendrobium* of Australia

Author: Peter B. Adams

Publisher: Natural History Publications (Borneo), Kota Kinabalu 2015.

Paperback: 160 pages (220mm x 155mm) ~150 colour photographs

ISBN: 9789838121637 (printed in Taiwan)

RRP: AUD\$25.00

The Author

Dr Peter B. Adams (Ph.D. University of Melbourne) is a Research Associate at the School of Botany, University of Melbourne, and National Herbarium, Royal Botanic Gardens, Melbourne. He has been involved in *Dendrobium* research for more than 30 years, including extensive field work with populations of *Dendrobium* species in all Australian states where they occur, and has written three books on orchids, as well as numerous articles in the international research literature. He is a grower, breeder and photographer of Australian orchids, particularly *Dendrobium* Section *Dendrocoryne*, and is Victorian State Judging Registrar for the Australasian Native Orchid Society and an Australian Orchid Council judge. He was a contributor to *Genera Orchidacearum* Volume 6 which covers the genus *Dendrobium*.

In the Foreword, Dr Phillip Cribb (Royal Botanic Gardens, Kew) writes: "Peter Adams has spent a lifetime studying the Australian orchids and knows them intimately in the wild, as his thorough and well-illustrated accounts confirm." Dr Peter ("Bill") Lavarack includes in part in his Message: "Peter Adams has been at the forefront of research into Australia's *Dendrobiums* for many years. His interests have encompassed the classification, ecology and the cultivation of this interesting group of orchids. He has qualifications in science with a Ph.D. in Botany. I have known Peter Adams for many years and have respected his painstaking thorough approach to research."

Introduction

We are told that Australia has about 60 of the nearly 1600 described *Dendrobium* species. Remarkably, given the title of the book, there is no commentary on what makes a *Dendrobium*, or the features that define the genus *Dendrobium*. The author has considered just two floral diagnostic features to define *Dendrobium*; Four (4) waxy pollinia, and a mentum (spur) at the back of the flower. That's it. Plant morphology has not been taken into any consideration whatsoever. We are then presented with a brief History of Discovery followed by a couple of paragraphs on The Variety of Australian *Dendrobiums*. There is a very good section on the orchid Habitats, with descriptions, locations and representatives of the different species expected to be found.

The photographs accompanying this part are excellent. This is followed by an interesting but generalised discussion on Classification and Taxonomy of *Dendrobium* in Australia and then there is half a page on Pollination. Next is a dichotomous Key to the Sections of *Dendrobium* in Australia, followed by a paragraph or so of descriptive information on each of the various Sections that occur in Australia, including lists of the plants illustrated. (When used in botanical terms, the rank of Section should always begin with a capital). What follows, starting on page 24 are The Species Entries, following the treatment in 2014's *Genera Orchidacearum* Vol. 6 (and the Kew Monocot Checklist), being such a mouthful that it is incorrectly spelt on page 22. A stylised map on page x shows the broad distribution of *Dendrobium* in Australia, although Lord Howe Island and northern offshore political islands are omitted.

The Species Entries

The *Dendrobium* species are not treated Section by Section (putting closely related species together), but generally presented in alphabetical order. However, I do not know why the natural hybrids *D. X suffusum* and *D. X superbiens* appear before the various *D. speciosum* entries. Where there are species with more than one subspecies or variety, general botanical protocol would dictate that the Type appears and is discussed first, followed by the other subspecific taxa. By alphabetical luck, the *D. bigibbum* entries are in order, but in *D. speciosum*, *D. teretifolium* and *D. tetragonum* the Type varieties all appear last.

For each species there is a condensed formal Description, which many readers may find difficult to use or comprehend without regular reference to the glossary. Also, centimetres are used where millimetres would have been tidier. This is followed by a sentence or two each, under Habitat and Ecology, Flowering Time, Distribution, Culture and Notes.

After going through each of these species entries, I was dismayed at the number, frequency and severity of errors as I went from page to page. For a book, it's paramount that every effort is made to ensure an error-free production, ensure the correct photographs are used with exact orientation, and with correct captions. There is an expectation that everything presented in a non-fiction book is factual.

as many take such books as being gospel. How did so many fundamental errors go unnoticed? Was this book proofread at any stage? I was bewildered, especially considering Dr. Adams' qualifications and tertiary standing in the botanical and scientific community. Personally, I completely lost confidence that he was the right person to be advising on *Dendrobium*, or any other Australian (or exotic) orchids, for *Genera Orchidacearum*.

I will go through the errors on a page by page, species by species basis. Some are highly significant, others are somewhat trivial, but they are still errors that should have been corrected before printing. For the purposes of this review I will consider all of these orchids as *Dendrobium*, and make corrections and comments accordingly. However, after reading and referencing a range of many published and unpublished accounts, including detailed Cladograms and Phylogenetic Trees showing DNA relationships, I only accept that there is one botanically true *Dendrobium* species in Australia.

Errors and Comments

Front Cover: it is a shame that the errors start with the cover image. This plant is identified as *Dendrobium bigibbum* var. *superbum* from Gulf of Carpentaria, Cape York. This is clearly the Type form of *Dendrobium bigibbum* (var. *bigibbum*) which is the taxon that occurs in that area. *D. bigibbum* var. *superbum* does not occur on the Gulf of Carpentaria, or along the western coast of Cape York Peninsula. The patch of fine white to cream hairs on the midlobe of the labellum is a consistent diagnostic feature of *D. bigibbum* var. *bigibbum*.

Page 24, *Dendrobium adae*: there is no mention of the bright gold and pinkish/brown colour forms that were reported with illustrations in *Australian Orchid Review* (2013) 78(5)28-33, and also no mention of the natural hybrid with *Dendrobium fleckeri* AOR (2014) 79(1)28-31. There are also apricot-coloured forms common on the Mount Windsor Tableland (this western location is not mentioned in the book). This was documented and illustrated in David Jones' 2006 *A Complete Guide to Native Orchids of Australia (including the island territories)*, a publication that remarkably does not appear in the further reading at the end of the book.

Page 25, *Dendrobium aemulum*: distribution is broader than documented, occurring from the Mount Windsor Tableland, north Queensland south to Mimosa Rocks National Park (east of Bega) south-eastern New South Wales. Adams suggestion that the forms of *D. aemulum* can all grow together and there is no significant difference between them is unfounded. At Barrington Tops NSW, I have seen the "ironbark form"

(that always has pale to bright cream flowers, that tend to have stiffer segments) on ironbark eucalypts and sheoaks, and the "brushbox form" (that always has crystalline white flowers, that tend to be more feathery) on brushbox trees, within one hundred metres of each other. I have never seen a different "form" growing on the others' host tree, or any intermediates. Those familiar with these orchids can readily tell them apart, from both vegetative and/or floral morphology.

Page 28, *Dendrobium affine*: the name *D. affine* is based on collections from Timor and at present there is no scientific (DNA) evidence to support the interpretation that this species occurs in Australia. The appropriate name for the Australian plants is *D. dicuphum* which is based on material collected near Darwin, Northern Territory.

Page 29, *Dendrobium agrostophyllum*: never has ten flowers on a stem, this is an error that has been perpetuated in literature for almost 50 years. 2 to 5 flowers are produced on a short inflorescence.

Page 30, *Dendrobium antennatum*: no providence is given for any of the photos in the book, which is a shame as firstly we are (maybe wrongly) assuming that it is always Australian examples of the species that are depicted. In many instances the location data is more important than the taxonomic diagnosis. You can always work out a plant name later, not the other way around. I'm assuming these three examples are indigenous to Australia. Providing broad location data gives credibility and instils a further level of confidence for the reader and students.

Page 32, *Dendrobium baileyi*: many broad terms are used throughout the book, where more exact data should be provided. Most readers will not have an idea what "very ephemeral flowers" means. Incidentally the word ephemeral is not included in the glossary, but it means short-lived. Saying the blooms last 6-8 hours is more exact (in the case of this species) and takes out other interpretations.

Page 34, *Dendrobium bigibbum*: a book such as this should insist on focusing on wild examples of the species, not ones raised in cultivation. Where only one to a few photographs are presented, they should be natural typical examples of the species, not horticulturally "improved" ones. Here we have what appears to be an example of the unstable hybrid cultivar *Dendrobium Enobi Purple 'Splash'* (white with purple edging). The background photo is so out of correct exposure that it gives the illusion of different coloured flowers, in any case it's out of focus without definition. Then on page 35, an example with mottled flowers, which would be highly suspect as being virus infected.



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Page 36, *Dendrobium bigibbum* var. *compactum*: the example on page 37 shows a typical and correctly identified example of this lithophytic taxon. However, the image shown on page 36 shows an example more typically seen in seed raised plants in cultivation. It is indistinguishable from examples shown on the following pages as *Dendrobium bigibbum* var. *superbum*. In reality, few orchid enthusiasts would have seen a pure strain of var. *compactum*, as many of the so called “linebred” plants are often a genetic mixture combining various members of the *Dendrobium bigibbum* complex. As noted, it is highly restricted in its distribution and it has a distinctive vegetative form – chunky pseudobulbs rarely more than 10-15cm tall (certainly not the 30cm as quoted in the text). True var. *compactum* is genetically much closer to var. *superbum* than var. *bigibbum*.

Page 38, *Dendrobium bigibbum* var. *superbum*: this is the true Cooktown Orchid, floral emblem of Queensland, yet this interesting fact doesn't rate a mention. The background habitat shot is annoying, with inflorescences of blooms “floating” unnaturally in the picture. Throughout the book, sweeping statements regarding “intergrades between varieties” is a term used too frequently, without evidence. No photographs or confirmed locations or specimens cited as proof. Personally, I have never seen a wild example that I could not instantly assign to variety *bigibbum*, *compactum* or *superbum*.

Page 40, *Dendrobium bowmanii*: is spelt incorrectly throughout this book; the specific name has only one “n”, not two. The northern point of distribution is 40 Mile Scrub in north Queensland. It also occurs in New Caledonia. The Type was collected by an E. Bowman (not Bowmann) at the Berserker Range, near Rockhampton, Queensland. The inset photograph is shown upside down, and the main image is a poor choice as it may mislead some readers into thinking it can produce more flowers on the inflorescence than it does (it shows three flower stems very close together with two open blooms on each).

Page 41, *Dendrobium brevicaudum*: Adams suggests that this is “similar to varieties of *D. teretifolium*”. Similar in growth form perhaps, but its flowering habit – swollen flower nodes to open blooms in about 7 days – and floral structure, are much closer to *D. cucumerinum*. As Adams is well known for being driven mainly by floral characters, and pays less attention to vegetative features, it is strange that he thinks *D. brevicaudum* is similar to *D. teretifolium*. This is followed by the sweeping statement “the *D. teretifolium* complex, *D. brevicaudum* and the New Guinea terete-leaved *Rhizobium* species require further study”. Firstly, he should have used the term “Section *Rhizobium*” in this context, as *Rhizobium* is a genus of soil bacteria that fix nitrogen. *Dendrobium brevicaudum* is very distinct and unlikely to be confused with similar taxa, either in Australia or New Guinea. Incidentally the various species from New Guinea collectively have a much finer root system than their Australian counterparts, and there are no species similar to *D. brevicaudum*. All the known species – in Australia and Papua New Guinea – have been well recorded, documented and illustrated. Obviously Adams just hasn't seen this raft of literature as there is no mention in the references / further reading.

Page 43, *Dendrobium canaliculatum*: the main photograph depicts an unusual coloured example with predominantly pale golden flowers, with a white labellum punctuated with a few faint dull gold markings. It's a shame we learn nothing

about this distinct and attractive plant. I wonder if it's actually a hybrid, possibly between *D. canaliculatum* and *D. trilamellatum* or *D. semifusum*. I agree that var. *pallidum* is only a colour form that should not be recognised at varietal level, as it would appear to be an albinistic / anthocyanin-free form, with white blooms with yellowish green tips to the segments, and a pure white labellum. (This information is not provided in the book). Interestingly, the Type of *D. canaliculatum* has brown and white flowers so the name var. *nigrescens* is superfluous.

Page 46, *Dendrobium cancrioides*: sadly this is where the book starts deteriorating from inaccurate to farcical. It becomes very clear that the author is unfamiliar with this distinctive endemic species. The inset photo is a typical example of this species. However, the main photo of “the plant” *in situ*, taken by the author, is not even a *Dendrobium*, but the unrelated *Appendicula australiensis*. Both species do grow in the same habitat at Mossman Gorge. *Dendrobium cancrioides* does not occur in Papua New Guinea. The plant erroneously depicted under that name in Andree Millar's *Orchids of Papua New Guinea*, with the same image used in both editions of her book, is of a related but different species. *Dendrobium gjellerupii* is a similar species from West Papua.

Page 50, *Dendrobium collinsii*: I wonder the real value of providing brief, one line cultural advice in a book such as this. Here we have a “tropical lowland” species, yet the recommendation is for “cool shaded moist conditions”. Such advice would quickly lead to the death of the plant in winter outside the tropics.

Page 53, *Dendrobium cucumerinum*: the flower photograph is upside down. The quoted 20 blooms per inflorescence is yet another perpetuated error that has never been confirmed. Number of flowers on an inflorescence is usually 3-6, but can be up to 12 on robust specimens.

Page 60, *Dendrobium falcorostrum*: the labellum, which is a unique diagnostic feature in this species, is described as “...conspicuously upcurved anteriorly to form a pointed apex (falcons beak)”. Adams then makes the bewildering statement “pale orange and yellow forms have been found”. This is incorrect. Trying to justify this, a single photo is included, but it's obviously a butter yellow *Dendrobium* hybrid. The labellum does not come close to matching what was stated several lines beforehand.

Page 66, *Dendrobium glabrum*: two different unclear images are used, showing non-flowering plants of this species well known under *Diplocaulobium*, yet the only flowering orchid in these photos is of *Eria kingii*? A single cut-out *D. glabrum* image is found floating and camouflaged with some out-of-focus tree foliage.

Page 69, *Dendrobium gracilicaule* var. *howeanum*: Adams described this variety as having “wide stems and no red-brown colour on the labellum, but some mainland plants fit this description”. I'm not sure what “wide stems” means, it's hardly a meaningful botanical term. The labellum does have pinkish suffusions. Perhaps Adams meant to say no red-brown blotches on the backs of the flowers (as in var. *gracilicaule*). *D. gracilicaule* var. *howeanum* has never been recorded from the Australian mainland, so perhaps he was confused by albinistic (pure green/yellow) forms of the Type variety. The single flower next to the caption of var. *howeanum*, is actually typical *D. gracilicaule* (that also does occur in New Caledonia).

Page 70, *Dendrobium X gracillimum*: Alum Mountain (not Mount Alum, as it was incorrectly called under the entry for *D. X delicatum*) is given as the southern point of distribution. This is unlikely, as *D. gracilicaule* does not occur on that 292 metre monolith at Bulahdelah, NSW. There have also been no verified reports of this natural hybrid where *D. speciosum* var. *speciosum* is the parent. Southern most point for *D. X gracillimum* was at Peats Ridge, on the NSW Central Coast – where the quarry is today. Sadly it's now extinct there. The late Vern Frampton found a few plants of *D. speciosum* var. *hillii* there in the early 1980s, along with *D. gracilicaule*. *D. speciosum* var. *speciosum* was common on the rocks. The single specimen of *D. X gracillimum* found was off a tree and had numerous small blooms, with a tiny labellum on a tall plant – pointing to *D. speciosum* var. *hillii* as the parent. Barrington Tops, NSW, is now accepted as the southern point of distribution for *D. X gracillimum*. The photographs (which look to be off the same plant) do not look typical for this natural hybrid at all. I would suspect the plant illustrated has been raised in cultivation. The large chunky flowers with hooking lateral sepals indicate that either var. *grandiflorum* or a large flowered Type form was used. It actually looks very much like the backcross onto *speciosum* – registered as *D. Gracious Cascades*. A photograph of a typical, wild example – with var. *hillii* as the parent – should have been used.

Page 71, *Dendrobium X grimesii*: in the notes Adams says, “A natural hybrid between *D. linguiforme* Sw. and *D. teretifolium* R.Br. var. *fasciculatum* Rupp, (syn. var. *fasciculatum*)”. Including “(syn. var. *fasciculatum*)” is confusing and superfluous. Typical *D. linguiforme* does not occur in north Queensland, so cannot be the parent of this hybrid. *D. linguiforme* var. *nugentii* is the correct taxon that should have been mentioned. The inset photograph is also upside down.

Page 74, *Dendrobium jonesii* var. *jonesii*: yes, *D. ruppianum* is indeed a synonym; however the author was F.M. Bailey, not Clemesha as stated. Steve Clemesha described the natural hybrid *D. X ruppiosum*. Attention to detail! Flower colour for var. *jonesii* can often age to yellowish-primrose tones.

Page 75, *Dendrobium jonesii* var. *magnificum*: Adams states that this robust variety always has a “pure white labellum”. Technically, this is correct according to the Type description. However, I have seen numerous specimens of var. *magnificum* from the Paluma Range, parts of the Atherton Tableland and Mount Windsor Tableland that have a network of purple lines and stripes on the labellum, some of these were growing with pure white lipped examples.

Page 76, *Dendrobium kingianum*: this is a highly variable species, and we are treated to images of eight different examples, but we don't know how many of these are of wild plants or derived from line breeding. Sadly that information is not given. *D. kingianum* subsp. *carnarvonense* (on page 80) is just a population at the northern limit of its range. Over the past twenty years that determination has been largely ignored. Adams also never explains his use of rank of subspecies over variety, or vice versa.

Page 81, *Dendrobium lichenastrum*: under notes, Adams writes: “Leaf forms very variable. The flowers of the two described varieties, var. *prenticei* and var. *lichenastrum* are indistinguishable. These plants are best regarded as a single species with no clear-cut varieties”. I believe there are two taxa involved and they can be readily identified, in or out of bloom. I do not accept that the flowers are indistinguishable, and have never seen a single specimen that may be considered

intermediate, even though there are localities where both grow together.

Page 85, *Dendrobium lobbii*: the author seems to lack confidence by saying “it is regarded by some as the only Australian terrestrial *Dendrobium*”. Just say it! It is.

Page 87, *Dendrobium macrostachyum*: This name is used to describe this widespread taxon throughout much of Southeast Asia. On the evidence provided, I am not convinced that this is the correct name for the Australian species, and I prefer to use *Dendrobium stuartii*. The bottom right image of a single bloom is a fine typical example of a genuine Australian plant. The Type specimen of *Dendrobium macrostachyum* was collected from the Western Ghats mountain range in southern India. I very much doubt this would be the same as the Australian taxon. Ironically, this is a true *Dendrobium* (Australia's only Section *Dendrobium* species).

Page 92, *Dendrobium monophyllum*: under this entry we have a new spelling of Queensland, a side-on shot of a flowering inflorescence of the “Lily of the Valley” orchid, yet the floating inset photo is of *D. schneiderae*.

Page 94, *Dendrobium mortii*: in the notes, *D. bowmanii* is spelt incorrectly, twice.

Page 96, *Dendrobium nindii*: again the number of flowers has been copied from other texts. Adams states 8-20 blooms on the inflorescence, yet the photograph used in this book clearly shows about 30 flowers.

Page 97, *Dendrobium pugioniforme*: the inset photo is upside down.

Page 98, *Dendrobium racemosum*: the northern end of its distribution is actually the Mount Windsor Tableland.

Page 104, *Dendrobium smilliae*: the main image shows a green and white flowered form in bud (with only two partially opened blooms), the floating inset photo on page 105 is upside down.

Pages 108-119, *Dendrobium speciosum* complex: (The book has been alphabetical until now, with these entries appearing after *D. X suffusum* and *D. X superbiens*, without explanation). Much has changed since Steve Clemesha did his review of the species back in 1981. Today, positive identification of the various taxa (at specific, subspecies or varietal rank) is almost primarily dictated by the location where the individual plant was found growing. This is not an ideal botanical situation, as it's almost impossible to confidently identify members of this highly variable complex from individual flowers alone. I do not follow the Adams treatment as obviously used in this book, and the close up images of the various varieties may further confuse readers. It should have been arranged with the Type variety first, then the other varieties. The examples of var. *blackdownense* on pages 108-109 look so dissimilar they could have been different varieties. Adams says “one of the most variable varieties with a wide range of habitats”. Apart from “being geographically separate from other varieties”, we are given no markers on what makes this taxon different, and why Adam *et al* described this at varietal level in the first place. The var. *boreale* on page 110 looks like a white form of the var. *curvicaule* shown on page 113. The var. *capricornicum* (very poor) plant and flower shown on page 111 is nothing at all like Clemesha's Type specimen (which the descriptions should be based on) from Mount Jim Crow. The var. *carnarvonense* could easily pass as a typical form from the Hawkesbury sandstone region in NSW. The flower image of var. *grandiflorum* on page 114, is so similar to that of var. *curvicaule* on the previous page, differing only in colour

intensity. I consider the var. *hillii* to be one of the most distinctive and stable of the varieties, and is readily identified by its small labellum. The two images of var. *pedunculatum* on page 118 are again not similar to Clemesha's Type specimen, with a chunky, cuppy bloom. Even the example of the Type form of the species on page 119 is not representative, in flower colour, shape or plant habit. Adams states that var. *speciosum* "intergrades with var. *hillii* in the north of the range, inland and north of Newcastle in central NSW." I have never seen any such plants and he provides no further data or evidence in support of yet another sweeping statement. I would suggest enthusiasts ensure (where known) to preserve the providence information on their plant tags and records. Without them, correct identification at specific/subspecies/varietal rank is almost a guess.

Page 120, *Dendrobium striolatum*: under notes, Adams states "it is variable over a wide distribution without clearly distinct taxa". Many would strongly disagree with this broad statement. There is a golden flowered subspecies (with few or faint striations at base of back of bloom) that is endemic to Tasmania, with a very compact growth habit. This was described under the genus *Dockrillia*, and there has been no combination change of this subsp. *chrysantha* to *Dendrobium*. There is another distinct population (at the northern limit of this species range) that has been known and recognised for decades as the "Watagan form" with larger (to 40mm) pale mushroom pinkish to reddish-brown blooms (with heavy striations on the reverse of the sepals), with a labellum twice the size and width of the Type form and highly frilled. This is indeed consistent across the population. This taxon has been described at specific level (in 2005, as *Dockrillia banksii*). Interesting, the colour forms presented here are not mentioned in the text. I believe both these distinctive populations have been ignored for this book as there are currently no alternate names under the genus *Dendrobium*, as they were described under *Dockrillia*.

Page 121, *Dendrobium taylori*: this species is spelt incorrectly throughout this book as *Dendrobium taylorii*.

Pages 122-127, *Dendrobium teretifolium* complex: unfortunately, under the heading of var. *baseyanum* on page 122, we start off with a major error of misidentification. Adams states "Considered to occur at higher elevations than var. *fasciculatum*, above 1000 metres (even though it says cm), in and around rainforest". Goes on to say "similar to var. *fasciculatum*, but less robust and smaller flowered." The inset photograph shows a form commonly seen at the southern end of the Atherton Tableland, with the main photo

(incidentally showing more flowers than mentioned in the description) of an example typical of what is found around the higher points of Mount Lewis. What Adams has described and illustrated here is an undescribed species/subspecies/variety from north Queensland, which has absolutely nothing to do with the plant originally described as var. *baseyanum*. Ironically, Adams ends the discussion on this variety with another sweeping statement "needs further study to define relationships". *Dendrobium baseyanum* was described at specific rank by St. Cloud in 1955, with the Type specimen from King's Plains, about 30km south to southwest from Cooktown at low elevation. It's a lowland tropical orchid, not a high elevation cloud-forest variety. In A.W. Dockrill's 1992 revision of *Australian Indigenous Orchids* (page 638) he reports "At approximately the time he described *D. baseyanum*, St. Cloud gave the present author (Dockrill) a piece of a plant claimed to be *D. baseyanum*. Under cultivation, this plant, within the space of three years, resembled, in both plant and flower, the present taxon (i.e. var. *fasciculatum*)". It's unfortunate that many growers and nurserymen, especially in Victoria, are wrongly applying this name. I have been to King's Plains, and the plants encountered there were typical robust var. *fasciculatum*. Both Dockrill 1992 volumes are mentioned in the further reading, but obviously not consulted or used for cross checking purposes. Under var. *fairfaxii* (page 123), it becomes apparent that Adams does not realise that *D. dolichophyllum* and *D. teretifolium* var. *aureum* are synonymous! He states "its status in the *D. teretifolium* complex is uncertain", and "more research is required". Please..., the information is already out there and easily accessible. Incidentally, the distribution for var. *aureum* is from the Richmond River in NSW to Kroombit Tops (western limit) and Eungella (northern limit) in north Queensland (extending past the ambiguous "southern Queensland", as stated in the book). Under var. *fasciculatum* (page 124) Adams says it resembles var. *teretifolium*. This is the most robust variety of this species, with thicker leaves, and lacking the zig-zag stem pattern of the Type variety. He mentions "var. *calamiforme*" as a synonym. This is incorrect, as it was described by Loddiges in 1841 at specific level as *Dendrobium calamiforme*, not as a variety of *D. teretifolium*. Adams also lists the yellow-green *Dockrillia sulphurea* from Cape York as a synonym. This is followed by the predictable "further study is required on this northern taxon" which by now I feel translates to "I really don't have a clue about this orchid". It's obvious Adams was unaware there is an alternate name for *Dockrillia sulphurea* under the genus *Dendrobium*. *Dockrillia sulphurea* was renamed

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as *Dendrobium whewellii* by Julian Shaw in 2014 in the English *Orchid Review*, 122(1305, Suppl.):17. Ironically I confirmed this information on the Kew Monocot Checklist, which Adams promotes. In the description of var. *teretifolium* (that again should have appeared in the book first, before the named varieties) he states "inflorescence usually single". The Type of this species is clearly the most floriferous of all of the named varieties, with up to six inflorescences produced at the base of the leaves and from nodes immediately behind, three being common on strong plants. That's why specimens can produce a 'cloud of flowers' that literally hide the plant. Again, errors from other texts are being perpetuated. Again we read "further work is required to determine relationships and taxonomic ranks, including the entities *D. teretifolium* var. *aureum* and *D. dolichophyllum*." *Dendrobium dolichophyllum* and *D. teretifolium* var. *aureum* are the same orchid, this is well documented. Then we are left guessing at the identity of the poor photograph of a pencil orchid on page 127, which could be var. *aureum*, but again no caption.

Pages 128-135, *Dendrobium tetragonum* complex: surely it is not good practice to want to give a different botanical designation to every isolated population of a given orchid throughout its range, especially where the actual differences are trivial? Most informed native orchid enthusiasts recognise four different taxa, at either specific or varietal rank. The focus should always be on the large number of similarities, not a few obscure and often insignificant, inconsistent and minute differences. Personally I prefer the term 'subspecies', as this better describes a population of similar individuals that are interbreeding. The term 'variety' I believe is poorly used in orchids and is best used to describe stable variants within a given population. The term 'forma' should be used purely for one-off colour forms (generally albinistic/albino). We start with subsp. *cataractarum* (page 128) described by Adams *et al* in 2011. Indeed why was this described as a subspecies, yet their other new combination within *tetragonum* (var. *serpentis*) was as a variety? In fact, why was it formally named at all? It is clearly and simply a noteworthy isolated northern extension in distribution (Connors Range, Qld) within the variation expressed in var. *melaleucaphilum*, as readers will also readily confirm from the photographs. Under var. *cacatua* (page 129), Adams states this taxon occurs "above 750m". Whilst this generally is a high elevation, rainforest inhabiting taxon, I have seen and photographed this distinctive small white-lipped species at Mossman Gorge (at 97m), growing next to plants of var. *giganteum*. Adams emphatically states "tepals yellow green, very filiform without red-purple brown markings, labellum pure white with no other colour". I agree with the pure white labellum (which is also the smallest and shortest in this complex). However, the main photograph on the same page contradicts the earlier statement, as it clearly shows reddish-brown markings at the base of the outside of the sepals

that also run along part of the edges of the same segments. The altitudinal range for var. *giganteum* (page 130) is given as "below 750m". This is generally the case; however populations of var. *giganteum* occur at 1100m on the Mount Windsor Tableland. The distribution quoted here for var. *melaleucaphilum* (page 132), is Rockhampton, central Queensland to north coast, New South Wales. The northern limit would now be the Connors Range, south to the central coast of NSW, as this taxon occurs in a localised habitat in the Watagan Mountains and there is an outlying population at the Colo River (Blue Mountains). Adams again suggests "intermediate forms are found" (between var. *melaleucaphilum* and var. *tetragonum*), again without evidence. In the few locations I know where both taxa exist and grow together (such as Urunga, NSW and Numinbah Valley, Qld), they can be readily identified out of bloom and the peak flowering times do not overlap. Described by Adams in 2011, var. *serpentis* (page 134), is a disjunct population from the northern end of the Blackdown Tableland that has been known for many years as a horticulturally desirable form due to its highly coloured labellum. The purple spots and blotches on the lip are generally brighter and larger than typically seen in southern examples of var. *melaleucaphilum*, even though these features are not highlighted in the book under review. Same colours, just different size and intensity of the markings on the labellum. Certainly not warranting description as a "new" variety, even if it allegedly has "twisting in the buds". This is simply an outlying population of var. *melaleucaphilum*. In fact (and the photographs presented actually support this further); subsp. *cataractarum* and var. *serpentis* are nothing more than disjunct northern populations of var. *melaleucaphilum*.

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Page 139, *Dendrobium wassellii*: perhaps fittingly these species entries end with a poor ambiguous photo of this orchid, that would make it difficult for readers to identify. Under Notes, Adams offers “flowers variable from closed to open and showy”. This vagueness sums up much of this book.

Glossary

A two page glossary is provided, explaining a number of botanical terms that are primarily mentioned in the brief descriptions.

Further Reading

A couple of things are quite evident here. Many texts provide a list of References – books that were read and consulted for technical information, data, photographs, drawings, maps, and cross-checking whilst compiling the new work. It also provides the reader a starting point for further research and indeed lets them see what publications the author has, or has not seen. There is also significant evidence where the author has copied much of the description information from older text/s where certain errors were initially made and subsequently further perpetuated. Frequently the distribution notes have been taken from works almost half a century old, with numerous later well-documented range extensions simply ignored. Many of these have been published in recent books and specific articles in major national periodicals *The Orchadian* and the *Australian Orchid Review*. Both these journals fail to rate a mention, except for two references published in *The Orchadian*, both co-authored by Adams. In this current book, Adams frequently says “further research is required”, where indeed such studies have been undertaken and published, he just hasn’t seen them – as such books/articles are not mentioned. This is inexcusable considering the vast library he has available at his fingertips, at the institutions he is connected with. Secondly, there are only 15 entries (books and articles) listed under Further Reading, and remarkably seven of these have Adams as author or co-author.

Acknowledgements

It appears Dr Peter B. Adams worked alone on this 2015 book *A Guide to Dendrobium of Australia*. In the Acknowledgements he thanks three people; Sheryl Lawson, Royal Botanic Gardens, Melbourne, for tireless encouragement and assistance in all aspects of the preparation of this book, especially critical review of drafts, typing and assembling of photographs. Andre Schuiteman, Royal Botanic Gardens, Kew, and Bill Lavarack provided advice and critical comment.

Photo Credits

Over three quarters of the 150 or so photographs published in this book were taken by the author. A dozen different contributors also provided one or a few images, and are subsequently individually credited with their photographs. The 14 habitat shots are valuable and they also give the reader an idea on the plant communities and environment. The clarity and freshness of these picturesque images makes you wish you could be instantly transported there. About a dozen images of *Dendrobium* species were taken by Jon Cara – respected member of ANOS Kabi Group (Qld); all of these are simply outstanding portraits. They are well framed with sharp focus, true colours and exposure, and importantly – for such a book – are typical examples of the species depicted. It’s a great shame that more of Jon’s images were not used, as some such as *D. mirbelianum* on page 23, were published without

credit or caption. Unfortunately, in this prolific digital age of outstanding photography and reproduction, too many images let this book down. Too many photos lack clarity, are poorly exposed (especially overexposed), unnatural contrast or not typical examples of the species or variety under discussion. Natural History Publications (Borneo) have set the benchmark for high quality texts with original content and correct information, coupled with impeccable photography. Unfortunately those high standards, in both text and images, have dropped with this book.

Appendix

Here the various Australian *Dendrobium* species are listed by Section. This is very useful and informative as it shows the natural groupings by listing closely related species in alphabetical order. It’s ironic that Adams stated earlier (on page 14) that “the genus *Dendrobium* is large and not readily divisible”, yet he and Andre Schuiteman had no problem pigeon-holing them in Sections and providing a dichotomous key to identify members at Sectional level. I generally agree with the various determinations made at Sectional level, just believe most should be upgraded to the rank of genus. It becomes a question of rank, and to be consistent with orchid taxonomy on a global scale, which is currently not evident. With long established and easily identifiable genera such as *Cadetia*, *Diplocaulobium*, *Dockrillia* and *Flickingeria* sunk back into *Dendrobium*, the taxonomic approach is basically the same that would have been used well over 100 years ago, apart from, ironically, a number of new varietal combinations authored or co-authored by Adams.

Summary

Well at least the publishers know what to fix if they intend a reprint at some later stage. Paradoxically, I believe future students and researchers will glean more useful and factual information from this review than the book itself.

Surely the likes of Cribb, Schuiteman and Lavarack did not see a final proof of this book before publication. So how can so many errors be identified by a lifelong amateur backyard orchid grower, such as myself, with a particular deep interest and enthusiasm for Australian native orchids? I am sometimes reminded by a few academic types (generally when they are put under pressure!), that I have no formal tertiary botanical training or credentials. True.

However, I have long had serious concerns about some botanists/scientists interpretations of DNA results. How can so many varied botanists/scientists disagree on the exact same sets of results with ITS-DNA (Internal Transcribed Spacer of Deoxyribonucleic Acid)? I admit being cynical at times as I believe many academics hide behind this as it is difficult for the layman to easily prove or disprove results. How do we know some of these results are not contaminated? Have they identified the initial specimens and samples correctly? DNA should not replace detailed floral and morphological studies; it should be used to confirm these findings, not the other way around, especially when the visual characters that many amateur enthusiasts observe, such as plant morphology, are being considered just as important as floral characteristics. At times, publishing in “peer reviewed” scientific journals does not guarantee a higher level of correctness or acceptance. How do we know or have the confidence in the reviewer/s that they have a complete grasp of the specialised subject matter presented to them?

Regarding the series of books known as *Genera Orchidacearum*, it's a fact that many phylogenetic trees depicting relationships between particular groups of orchids, such as that of Orchideae, Coelogyninae, Bulbophyllinae, Aeridinae, Eriinae etc, are published in the various volumes, all without any supporting scientific evidence in the form of voucher information for the collections on which each analysis was based. And yet we are asked to take these results as gospel, without any supporting evidence. Compare that with a well written scientific paper published where each collection is vouchered, and the DNA sequences used are cited and lodged in GenBank where anyone can find it, use it and retest the results if they so desire.

The books blurb quotes "There have been a number of approaches to the classification of *Dendrobium* and related genera over the past 30 years. Classification and nomenclature are always evolving as new information becomes available. *Genera Orchidacearum* Volume 6 (2014) included evidence from morphology, DNA and all other areas of study and provided an international consensus for *Dendrobium*, bringing a long-awaited degree of stability to the genus. This book follows the *Genera Orchidacearum* Vol. 6 approach and the Kew Monocot Checklist, and considers all available published evidence on the genus". I do not accept there is an "international consensus for *Dendrobium*" or believe the statement that they considered "all available published evidence on the genus".

The concept of such a guide to include all the Australian "*Dendrobium*" species was sound and encouraging; however the subsequent execution has proved highly disappointing. It is not a field guide. Regardless of the intended target market or knowledge level of the reader, the information provided simply must be correct. There have been numerous poor selections, on a number of levels.

With such an erratic and inconsistent taxonomic approach, it is clear that Peter Adams marches to the sound of a different drum. I would be confident in suggesting that there would not be a single individual who would follow all aspects of his unique botanical and taxonomic thinking, as delivered in *A Guide to Dendrobium of Australia*. It's apparent that the author lacks intimate knowledge of these orchids and indeed is unfamiliar with many of the species depicted. Sadly, there is very little original or new factual information in this book. It's now there for all to see, and it's hard to bluff when archived in print. The unacceptable level, range and plethora of errors, omissions and inaccuracies throughout this book are strong evidence of carelessness bordering on incompetence. ★

David P. Banks

Editor, Australian Orchid Review

Life Member, Australasian Native Orchid Society

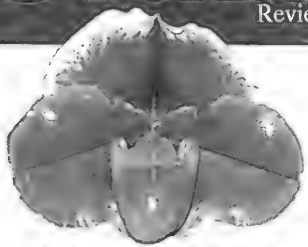
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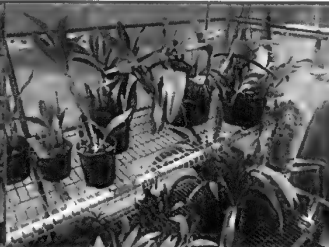
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Eight New Species in the *Diuris corymbosa* Lindley Complex (Orchidaceae) from Western Australia

by David L. Jones and Christopher J. French

Abstract

Eight new Western Australian species related to *D. corymbosa* Lindley from subgenus *Hesperodiuris* Section *Suffusae* are described as new.

Key Words

Orchidaceae, *Diuris brevis*, *D. carecta*, *D. littoralis*, *D. oraria*, *D. ostrina*, *D. pallescens*, *D. suffusa*, *D. tinctoria*, *D. corymbosa*, new species, *Hesperodiuris*, *Suffusae*, Western Australia, Australian flora.

Introduction

Morphological and molecular studies support the recognition of five subgenera and nine sections within *Diuris* (Jones & Clements 2006, Indsto *et al.* 2009), and this arrangement is reflected in a recent treatment of Western Australian *Diuris* (Brown *et al.* 2013). A very significant complex of species in Western Australia, known as the *Diuris corymbosa* Lindley complex, is placed infragenerically in subgenus *Hesperodiuris* Section *Suffusae* (Jones & Clements 2006). Species in this group are characterised by flowers with various colours in suffused patterns over a yellow background, lateral lobes of the labellum as large as the midlobe, the midlobe folded along the mid-line and with a single callus ridge. This group of *Diuris* is very well developed in Western Australia where they behave as floral mimics of a range of colourful native leguminous shrubs. The patterns of colour exhibited by the orchid flowers often show similarities with a species or group of native legumes that grow in the same habitat as the orchid. The central area of the *Diuris* flower, that is the dorsal sepal, labellum lobes and column, also presents a physical mimic of a legume flower. Thus the arrangement of the floral segments (sepals, petals and labellum lobes) can have an impact on attracting insects to the flower. Several orchids in this group have sepals (lateral and dorsal) and sometimes also petals that recurve out of the way and leave the centre of the flower as the main feature visible to any visiting insect. As both flower colours and the arrangement of the flower parts are important for pollinator attraction and delineation of taxa, they are emphasised in our treatment of the group.

Six new species were described in 1991 (Jones 1991) and five more have been named recently (Jones & French 2012, Jones & French 2013a,b,c, French & Brockman 2013). Eight more species are described here as new.

Materials and Methods

Descriptions of the new taxa were made from fresh specimens. Unless otherwise indicated, all types of *Diuris* relevant to this study (or photographs thereof), and collections cited, have been seen by us.

Taxonomy

1. *Diuris brevis* D.L.Jones & C.J.French, *sp. nov.* With affinity to *D. corymbosa* Lindley, but differing by its much shorter habit, fewer, much smaller flowers (20–25 mm across) that are yellow heavily suffused and marked with red to red-brown, dorsal sepal about as long as wide, and the labellum midlobe appreciably shorter than the lateral lobes.

Type: Western Australia. Kenwick Swamp, 30 Aug. 1997, D.L.Jones 15200 & C.J.French (holo CANB 620872; iso MEL, PERTH).

Illustration: Brown, Dixon, French & Brockman (2013), Page 215, as *Diuris* sp. “Perth Swamps”.

Description: *Leaves* basal, usually two, linear to linear-lanceolate, 5–16 cm long, 3–8 mm wide, bright green. *Scape* 15–30 cm tall, one-five-flowered. *Pedicels* 10–25 mm long, very slender. *Flowers* porrect, 20–25 mm long, 20–25 mm across, yellow heavily marked with red to red-brown, the exterior surface heavily stained with brown; petals often yellow, dorsal sepal yellow suffused with brown, labellum lateral lobes yellow with brown or red-brown tips, midlobe mostly red or red-brown, lateral sepals reddish-brown with green tips. *Dorsal sepal* transversely obovate, 6–8 mm long, 6–9 mm wide; apex apiculate. *Lateral sepals* deflexed, crossed and recurved, narrowly oblong, 11–16 mm long, 1.5–2.5 mm wide, falcate; margins involute. *Petals* obliquely erect, widely divergent, 14–18 mm long; claw linear, 3–4 mm long, straight or curved, blackish; lamina elliptic, 10–14 mm long, 7–9 mm wide. *Labellum* 4–5 mm long, porrect with a shallowly decurved apex, deeply 3-lobed; lateral lobes spreading widely, asymmetrically oblong-ovate, 5–6 mm long, 3–4 mm wide; midlobe flattish, the margins shallowly downcurved, narrowly cuneate when flattened, 4–4.5 mm long, 4–4.5 mm wide, apex flared, shallowly folded along the midline; anterior margins slightly irregular. *Labellum callus* consisting of a single yellow ridge 3–4 mm long, smooth. *Column* porrect from the end of the ovary, 3.5–4.5 mm long, c. 2 mm wide. *Column wings* oblong, c. 3.5 mm long, c. 1 mm wide, cream with irregular margins. *Anther* very narrowly ovate, c. 3.5 mm long, c. 1.5 mm wide, cream with purple-brown markings. *Pollinarium* c. 3 mm long, c. 1.5 mm wide. *Stigma* narrowly cordate, c. 2.5 mm long, c. 1.2 mm wide. *Capsules* not seen. **Fig. 1.**

Distribution and ecology: Currently known only from the type locality at Kenwick. Possibly occurring in other wetlands in the eastern suburbs of Perth but much of this habitat has been lost to urbanisation. At the type locality the orchid grows among sedges and low shrubs in moist to wet black peaty soil and sandy clay in and around the margins of

shallow water. The vegetation surrounding the swamp is dense low shrubland with scattered stunted Jarrah. The orchid flowers freely without fire. Flowering occurs early August to early September.

Recognition: This new species is characterised by short habit, few flowers in the raceme, small flowers (20-25 mm across) that are yellow heavily suffused with red to red-brown, dorsal sepal about as wide as long, long labellum lateral lobes and a short decurved midlobe. When flattened the labellum lateral lobes are obviously longer than the midlobe.

Similar species: A very distinctive species that is part of the *D. corymbosa* complex but readily distinguished by its small flowers and short labellum midlobe. Its swampy habitat is also notable.

Conservation status: Although once probably widespread in swamps around Perth, this species is now apparently restricted to a single locality where it is threatened by weed invasion, drainage, intense urban encroachment and in dire need of help. We suggest the species is threatened and should be treated as vulnerable or endangered according to the conservation codes for West Australian flora and fauna.

Etymology: The Latin *brevis*, short, in reference to the abbreviated labellum midlobe.

Other specimens: WESTERN AUSTRALIA. Brixton Rd swamp, 23 Aug. 1998, C.J.French (CJF1248) (CANB); Kenwick Swamps, 24 Aug. 1986, D.L.Jones 2344 (CANB).



Diuris brevis
Brixton Rd
Wetlands
240813



Diuris brevis
Brixton Rd
Wetlands
240813

Orchid Species Plus

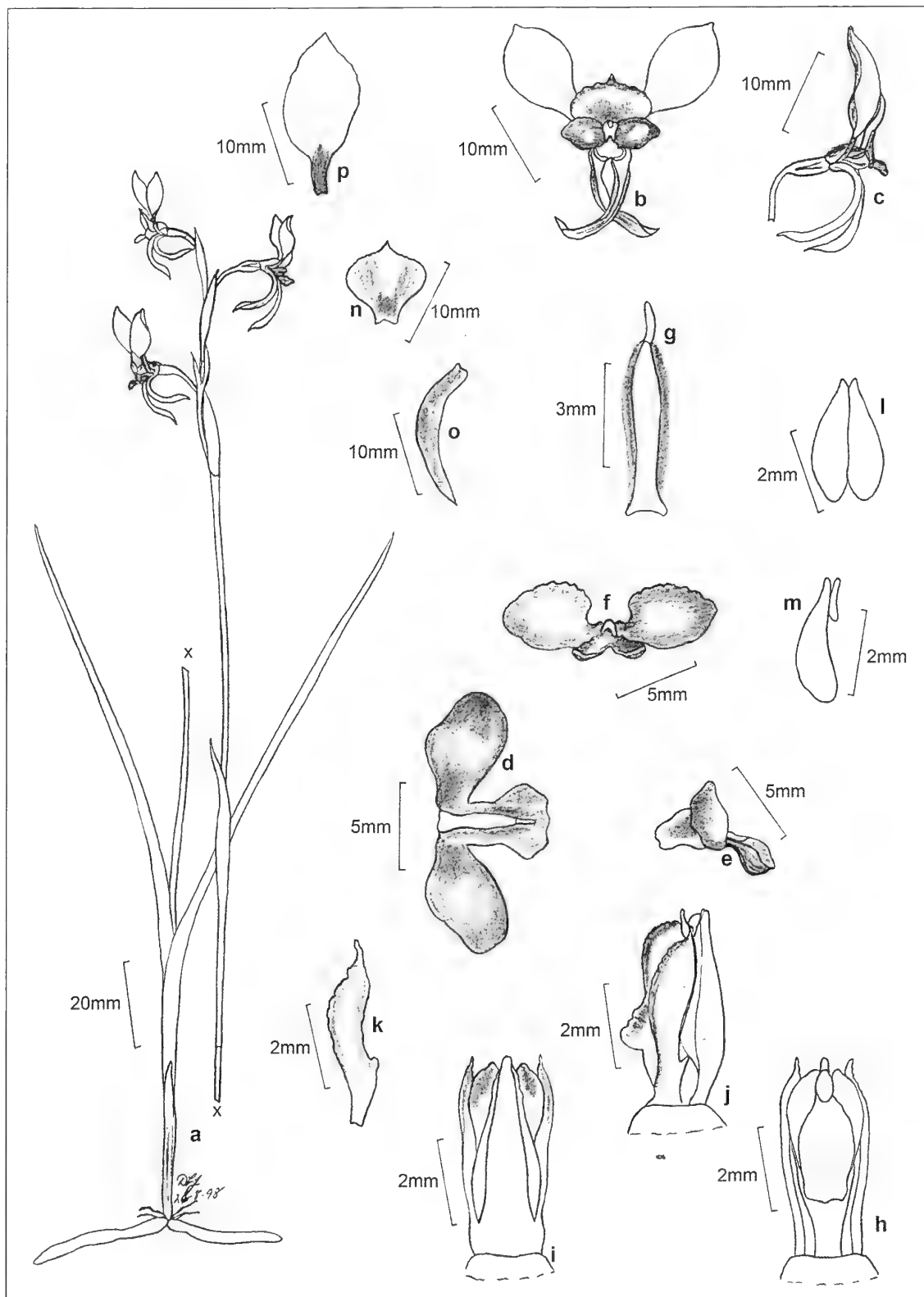
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***Diuris brevis*, Brixton Rd swamp, WA , C.J.French 1248.**

a. flowering plant; b. flower from front; c. flower from side; d. labellum from above, flattened; e. labellum from side; f. labellum from front; g. callus; h. column from front; i. column from rear; j. column from side; k. column wing; l. pollinarium from above; m. pollinarium from side; n. dorsal sepal; o. lateral sepal; p. petal.

Fig. 1. © D.L.Jones 24 August 1998

2. *Diuris littoralis* D.L.Jones & C.J.French, *sp. nov.*

With affinity to *Diuris magnifica* D.L.Jones but differing by its earlier flowering period, fewer flowers in the raceme (up to six flowers in *D. littoralis*, to nine flowers in *D. magnifica*), smaller flowers (25–30 mm across in *D. littoralis*, 30–50 mm across in *D. magnifica*) and shorter, much narrower labellum midlobe (6–8 x 4–7 mm in *D. littoralis*, 13–18 x 9–15 mm in *D. magnifica*); the new species also has affinity with *D. jonesii* C.J.French & G.Brockman but differs by its earlier flowering period, longer flowers (25–35 mm long in *D. littoralis*, 35–50 mm long in *D. jonesii*), broadly elliptic, yellow petal laminae (oblong-elliptic, brownish-yellow in *D. jonesii*) and shorter labellum midlobe.

Type: Western Australia. Spencer Park, Albany, near hospital, 29 Aug. 1986, *D.L.Jones* 2421 (holo CANB 668619).

Illustrations: Hoffmann & Brown (2011), Page 463 as *Diuris* sp. "South Coast". Brown, Dixon, French & Brockman (2013), Page 213, as *Diuris* sp. "Green Range".

Description: *Leaves* basal, two or three, linear to linear-lanceolate, 8–20 cm long, 3–8 mm wide. *Scape* 18–30 cm tall, one-six-flowered. *Pedicels* 20–50 mm long. *Flowers* perfect, 25–35 mm long, 25–30 mm across, yellow heavily marked with brown, the exterior surface heavily stained with brown or appearing as broad bands; petals yellow, dorsal sepal yellow stained with light brown, labellum lateral lobes brown towards the tips, midlobe with prominent mauve-purple markings, lateral sepals reddish-brown with green tips. *Dorsal sepal* transversely ovate, 8–11 mm long, 8–13 mm wide, margins slightly irregular, apex shortly apiculate. *Lateral sepals* deflexed, straight or shallowly recurved, parallel or crossed, narrowly oblong, 12–19 mm long, 2–3 mm wide, slightly falcate; margins involute. *Petals* obliquely erect, close or widely divergent, 13–20 mm long; claw linear, 3–5 mm long, straight or curved, blackish; lamina broadly elliptic, 12–14 mm long, 5–11 mm wide. *Labellum* 7–9 mm long, porrect with a shallowly decurved apex, deeply 3-lobed; lateral lobes spreading widely, tips sometimes recurved, asymmetrically oblong, 7–9 mm long, 3–5 mm wide; midlobe convex, margins downcurved, wedge-shaped when flattened, 6–8 mm long, 4–7 mm wide; anterior margins entire. *Labellum callus* consisting of a single yellow ridge 4–5 mm long, smooth. *Column* porrect from the end of the ovary, 4.5–5 mm long, c. 3 mm wide. *Column wings* oblong, c. 4 mm long, c. 1 mm wide, cream with irregular margins. *Anther* very narrowly ovate, c. 3 mm long, c. 2 mm wide, cream with purple-brown markings. *Pollinarium* c. 3 mm long, c. 1.5 mm wide. *Stigma* cordate, c. 3 mm long, c. 2 mm wide. *Capsules* not seen.

Distribution and ecology: Coastal and near-coastal areas extending east from near Denmark to Esperance with a disjunct population at Toolinna Cove, on the Great Australian Bight, east of Balladonia. Most commonly it grows in Jarrah forest with a low shrubby understorey; occasionally in coastal heath and in wire grass on well-drained laterite and moist to wet stony clay near streams; rarely on stabilised sand dunes under *Agonis flexuosa*. Soils are mainly sand and laterite. At Toolinna Cove it grows in shallow sand over limestone at the edge of coastal limestone cliffs. It flowers freely without fire. Flowering occurs late July to early September.

Recognition: Characterised by early flowering habit and moderately large colourful flowers with strongly marked colours in the labellum.

Similar species: The new species has similarities with both *D. magnifica* and *D. jonesii*, but can be immediately distinguished by its smaller flowers, different colour combinations in the flowers, earlier flowering period and more south easterly distribution (see also the diagnoses at the beginning of this species entry for other differences). *Diuris littoralis* could also be confused with the Yalgorup Donkey Orchid (page 218 Brown *et al.* 2013) but it flowers earlier with shorter habit and fewer flowers and is distributed disjunctly from that species. A further undescribed taxon within the *Diuris corymbosa* complex and similar to *D. brumalis* shares the distribution of the new species but has finished flowering before *Diuris littoralis* starts to flower. It has even smaller, paler flowers.

Conservation status: Widely distributed, locally common and conserved in Hassell National Park and West Cape Howe National Park.

Etymology: The Latin *littoralis*, pertaining to the sea shore, in reference to the preference of this species to grow in coastal and near-coastal habitats.

Other specimens: WESTERN AUSTRALIA. Hassell Hwy, 600 m ne of Drawbin Rd, 16 Aug. 1997, *C.J.French* 599 (CANB); Highway One, 5.5 km s of Jerramungup, 18 Aug. 1997, *C.J.French* 631 & 631a (CANB).



Diuris littoralis
Toolinna Cove Cliffs
120813



Diuris littoralis
Toolinna Cove Cliffs
120813



Diuris littoralis
Middleton Beach Rd
Albany
190801



Diuris littoralis
Green Range
140800

3. *Diuris ostrina* D.L.Jones & C.J.French, *sp. nov.* With affinity to *Diuris magnifica* D.L.Jones and *D. amplissima* D.L.Jones, but differing by its smaller flowers (32-42 x 25-35 mm in *D. ostrina*, 55-65 x 30-50 mm in *D. magnifica*, 60-70 x 30-50 mm in *D. amplissima*), which are mostly pale brownish with mauve to purple suffusions on the labellum lobes, and labellum with broad lateral lobes and a wedge-shaped labellum midlobe which tapers strongly to a narrow base. *Diuris ostrina* also has affinities with *D. corymbosa* Lindley which has smaller flowers without purple tones and a wider labellum midlobe with a broad base.

Type: Western Australia. Avon District. Greenmount National Park, 8 Sep. 1997, W.Jackson (D.L.Jones 15532) (holo CANB (CBG 9908829); iso AD, MEL, NSW, PERTH).

Illustrations: Brown, Dundas, Dixon & Hopper (2008), Page 165 as *Diuris* sp. "Darling Range". Hoffmann & Brown (1998), Page 433 as *Diuris* aff. *magnifica* (Darling Range Donkey Orchid). Hoffmann & Brown (2011), Page 472 as *Diuris* sp. "Darling Range". Brown, Dixon, French & Brockman (2013), Page 211 as *Diuris* sp. "Darling Scarp". It has the phrase name *Diuris* sp. Darling Scarp (G.B. Brockman 1118) in FloraBase, the native plant database maintained by the Western Australian Herbarium, Department of Parks and Wildlife, Government of Western Australia.

Description: Leaves two or three, linear to linear-lanceolate, 8-25 cm long, 4-8 mm wide. Scape 25-40 cm tall, one-five-flowered. Pedicels 20-40 mm long. Flowers porrect, 32-42 mm long, 25-35 mm across, brown to brownish-yellow and mauve-purple, the exterior surface of all segments stained with brown; petals mostly pale brownish, dorsal sepal brown to brownish-purple and the labellum with strong mauve to purple suffusions, lateral sepals greenish-brown with green tips. Dorsal sepal transversely ovate, 10-13 mm long, 12-18 mm wide, margins slightly irregular. Lateral sepals stiffly deflexed, straight or slightly recurved, parallel or crossed, narrowly oblong, 15-22 mm long, 2.5-3 mm wide, slightly falcate. Petals obliquely erect, divergent, 18-23 mm long; claw linear, 3-5 mm long, 1.5-2 mm wide, straight or curved, reddish-brown; lamina broadly elliptic, 15-18 mm long, 9-14 mm wide. Labellum 8-12 mm long, porrect, deeply 3-lobed; lateral lobes somewhat incurved to spreading, tips straight, asymmetrically ovate-oblong, 9-12 mm long, 4-6 mm wide; midlobe convex, margins strongly downcurved, broadly cuneate when flattened, 8-12 mm long, 8-12 mm wide, very narrow at the base then widely flared; anterior margins entire or slightly irregular; apex emarginate. Labellum callus consisting of a single yellow ridge 4-5 mm long, smooth. Column porrect from the end of the ovary, 4-4.5 mm long, c. 3.5 mm wide. Column wings lanceolate, c. 4 mm long, c. 1.5 mm wide, cream to yellowish with irregular margins. Anther narrowly ovate, c. 4 mm long, c. 2.5 mm wide, cream with purple-brown markings. Pollinarium c. 4 mm long, c. 2.5 mm wide. Stigma cordate to quadrate, c. 3.5 mm long, c. 2.5 mm wide. Capsules not seen. **Fig. 2.**



Distribution and ecology:

Apparently restricted to the Darling Scarp and known from a handful of sites between Greenmount and Armadale, with westerly occurrences at Mt Dale and the Serpentine River crossing on the Albany Highway. It grows in shrubby Jarrah-Marri forest in laterite. A disjunct population growing in sand under Jarrah-Marri woodland has been recorded south-east of Pinjarra. Plants in two localities have colonised road verges and are considered at risk due to shire road maintenance activities. Flowers freely without fire. Flowering occurs mid September to late October.

Recognition: Characterised by late flowering period, often tall plants, moderately large flowers, the petals mostly pale brownish, the dorsal sepal brownish-purple and the labellum with strong mauve to purple suffusions, the exterior surface of all segments stained with brown, and the labellum with broad lateral lobes and a wedge-shaped midlobe which tapers strongly to a narrow base.

Similar species: *Diuris ostrina* has similarities with *D. magnifica*, which is mainly found in sandy coastal habitats and has much larger flowers with yellow petals. It also has affinities with *D. amplissima* which has even larger brownish flowers with relatively narrow oblong petal laminae and occurs in inland areas much further south (see also the diagnoses at the beginning of this species entry for other differences).

Notes: To date, *Diuris magnifica* and *D. ostrina* have not been found growing together, however *D. ostrina* and *D. amplissima* have been found growing together in one location. *Diuris brumalis* flowers in the same location as *D. ostrina* but has smaller flowers and shorter plants which have finished flowering well before *D. ostrina* begins to flower.

Conservation status: This species has a restricted distribution consisting of small scattered populations but it is conserved in Greenmount National Park; it is threatened in some sites by weed invasion, urban encroachment, road maintenance activities and habitat degradation. We suggest it be treated as a rare and poorly-known species worthy of conservation studies.

Etymology: The Latin *ostrinus*, purple, in reference to the predominance of this colour in labellum of the flowers.

Selected specimens: WESTERN AUSTRALIA. Padbury Road, Darlington, 14 Sep. 1997, *C.J.French* 809 (herb.



Diuris ostrina
Burnside NR
230907

C.J.French); Kwolyinine Nature Reserve, 3 km s of Great Eastern Highway, 27 Sep. 1997, *C.J.French* 842 (CANB); Mt Dale, 19 Oct. 2002, *C.J.French* 3572 (herb. *C.J.French*); Admiral Road, 1.3 km from Albany Highway, 23 Oct. 2004, *C.J.French* 6025 (herb. *C.J.French*); Greenmount National Park, 17 Sep. 1997, *F.Hort* 46 (CANB); Albany Highway, 1.75 km W of Canning Dam Road junction, 30 Oct 2003, *G.Brockman*, GBB1121 (PERTH); Admiral Road, 1.35 km s of Albany Highway, 28 Oct 2003, *G.Brockman* GBB1118 (PERTH).

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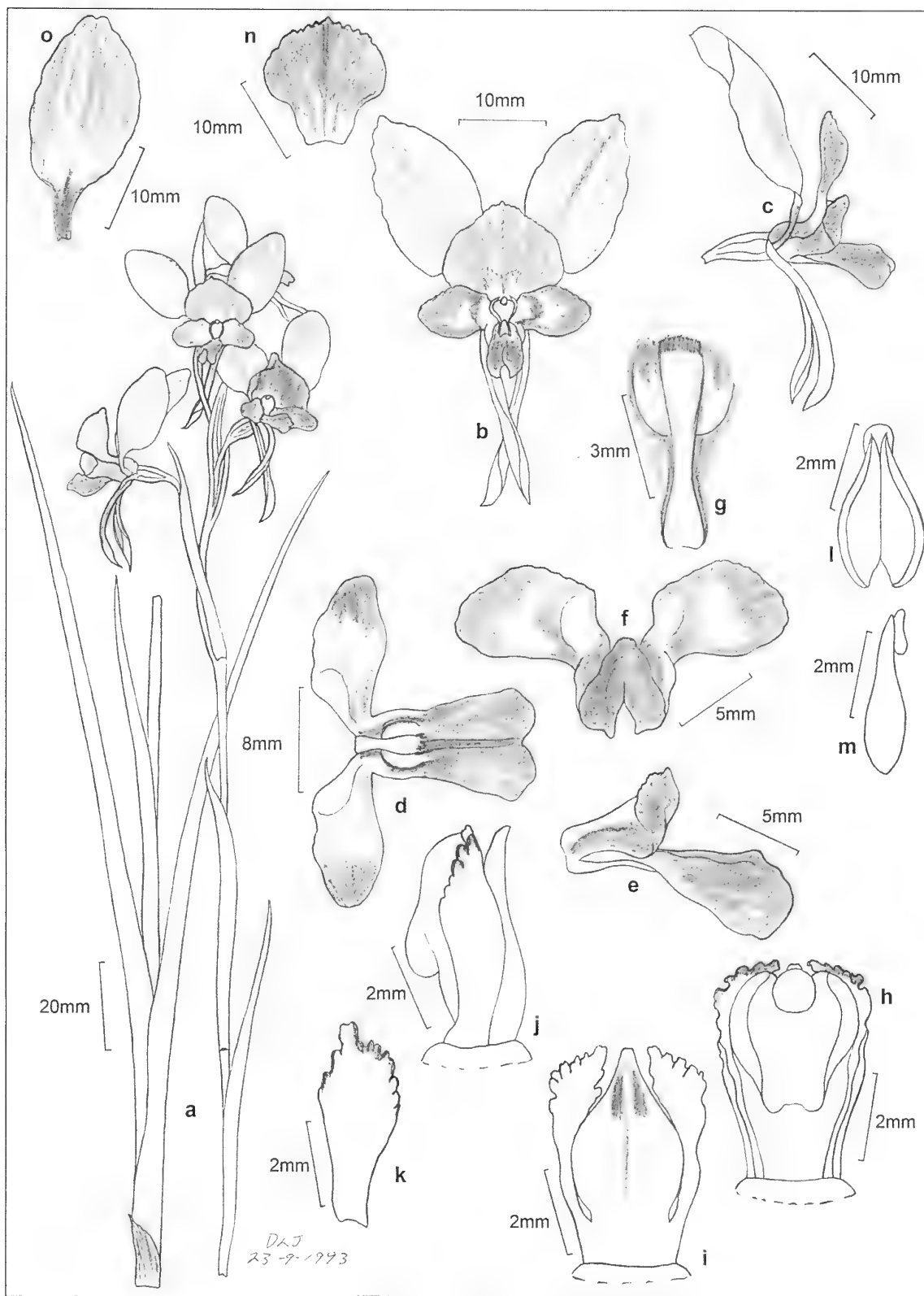
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***Diuris ostrina*, Greenmount, WA, N.Hoffman (DLJ12022).**

a. flowering plant; b. flower from front; c. flower from side; d. labellum from above, flattened; e. labellum from side; f. labellum from front; g. callus; h. column from front; i. column from rear; j. column from side; k. column wing; l. pollinarium from above; m. pollinarium from side; n. dorsal sepal; o. petal.

Fig. 2. © D.L.Jones 23 September 1993

4. *Diuris pallescens* D.L.Jones & C.J.French, *sp. nov.*

With affinity to *D. recurva* D.L.Jones, but differing by its more crowded flowers (widely spaced in *D. recurva*), and much paler flowers (pale yellow with light-brown to red-brown markings; those of *D. recurva* are bright yellow densely suffused with dark burgundy red), petals with shorter stalks (*D. pallescens* 3-4.5 mm long cf. *D. recurva* 4-6 mm long) giving the flower of *D. pallescens* a much more compact appearance than that of *D. recurva*, larger petal laminae (*D. pallescens* broadly elliptic to nearly orbicular petal laminae, 8-14 x 5-8 mm cf. *D. recurva* narrowly elliptic to ovate, 5-7 x 4-6.5 mm) and larger midlobe (*D. pallescens* 5-6 x 6-7 mm cf. *D. recurva* 4-5 x 3-4.5 mm); it also has affinity with *D. corymbosa* Lindley but that species has larger more colourful flowers (*D. corymbosa* has bright yellow, brown and purple flowers 25-35 mm across), and its sepals do not recurve.

Type: Western Australia. Caron Nature Reserve, Wubin – Perenjori Road, 17 km south of Perenjori, 28 Aug. 2005, C.J.French 6220 (holo CANB 670156).

Illustration: Brown, Dixon, French & Brockman (2013), page 214 as *Diuris* sp. "Mid North".

Description: *Leaves* basal, semi-erect to lax, conduplicate, two to three, linear to linear-lanceolate, 15-30 cm long, 4-7 mm wide, bright green. *Scape* 15-35 cm tall, slender, green, one-seven-flowered. *Pedicels* 15-45 mm long, slender. *Flowers* porrect, 25-30 mm long, 10-15 mm across, pale yellow with light-brown to red-brown markings, the exterior surface of all segments stained with red-brown; petals mainly yellow, dorsal sepal and lateral lobes yellow suffused with red-brown, midlobe heavily marked with brown or red-brown, lateral sepals reddish-brown with green tips. *Dorsal sepal* recurved, transversely ovate, 6-8 mm long, 7-9 mm wide, apiculate. *Lateral sepals* deltexed, crossed and recurved, narrowly oblong, 10-14 mm long, 2-3 mm wide, falcate. *Petals* obliquely erect, divergent, 13-18 mm long; claw linear, 3-4.5 mm long, c. 1 mm wide, reddish-brown; lamina broadly elliptic to nearly orbicular, 8-14 mm long, 5-8 mm wide. *Labellum* 5-7 mm long, porrect with a decurved apex, deeply 3-lobed; lateral lobes spreading widely, tips shallowly recurved, asymmetrically oblong-ovate, 4-7 mm long, 3-4 mm wide; midlobe convex, the margins sharply downcurved, wedge-shaped





Diuris pallescens
Gunyidi - Wubin Rd
050910



Diuris pallescens
Gunyidi - Wubin Rd
050910

when flattened, 5-6 mm long, 6-7 mm wide; apex entire or slightly emarginate. *Labellum callus* consisting of a single yellow ridge 3-4 mm long, smooth. *Column* porrect from the end of the ovary, c. 3.5 mm long, c. 2.5 mm wide. *Column wings* lanceolate, c. 3.5 mm long, c. 1.5 mm wide, cream to yellowish with irregular margins. *Anther* narrowly ovate, c. 3 mm long, c. 1.3 mm wide, cream with purple-brown markings. *Pollinarium* c. 3 mm long, c. 2 mm wide; *viscidium* elliptic, c. 0.6 mm long; *pollinia* clavate, c. 2.5 mm long, white, mealy. *Stigma* cordate to quadrate, c. 2.5 mm long, c. 2 mm wide. *Capsules* not seen.

Distribution and ecology: Restricted to an area more or less between Three Springs, Coorow and Dalwallinu. It grows among low heathy shrubs, often in wetter sites near the margins of low granite outcrops and other drainage lines, but avoiding very wet and boggy areas. The soil is heavy gravelly loam. The orchid flowers freely in the absence of fire. Flowering occurs late August to mid-September.

Recognition: Characterised by a relatively late flowering habit for a northern species of the *D. corymbosa* complex, small (10-15 mm across), pale yellow flowers with light-brown to red-brown markings, broadly elliptic to nearly orbicular petal laminae, strongly recurved dorsal sepal, crossed and recurved lateral sepals and a small labellum.

Similar species: Both *Diuris recurva* and *D. pallescens* have a strongly recurved dorsal sepal and the lateral sepals recurve right back under the labellum leaving the central part of the flower conspicuous. The flowers of *D. pallescens* are much paler than those of *D. recurva* and they have a much more compact appearance since the petals of *D. recurva* have a longer stalk and smaller blade than those of *Diuris pallescens*. *Diuris recurva* also flowers earlier than *D. pallescens*. *Diuris corymbosa* itself is easily distinguished from *D. pallescens* by its much larger brightly coloured flowers, erect dorsal sepal and deflexed but not recurved lateral sepals (see also the diagnoses at the beginning of this species entry for other differences). *Diuris suffusa*, also described as new in this paper, is somewhat similar to *D. pallescens* and flowers at a similar time but has a more south-easterly distribution, cream to creamy-yellow flowers and the sepals are straight to shallowly recurved.

Conservation status: Locally common and conserved in reserves.

Etymology: The Latin *pallescens*, pale, wan, becoming paler, in reference to the very pale-coloured flowers.

Selected specimens: WESTERN AUSTRALIA. Caron Nature Reserve, Wubin – Perenjori Road, 17 km s of Perenjori, 28 Aug. 2005, C.J.French (CJF-6221) (CANB); Mingenew - Three Springs Road, 10.8 km n of Three Springs, 12 Aug. 2001, C.J.French (CJF-2883) (CANB); Midlands Road, junction with Coorow-Greenhead Road, 26 Aug. 2012, G.Brockman (GBB2884) (PERTH); Midlands Road, Salt Creek Bridge 6km s of Coorow, 26 Aug. 2012, G.Brockman (GBB2888) (PERTH); Corner of Pithara east Road and Petruder Road, 13 Sep. 2013, G.Brockman (GBB3217) (PERTH); Petruder Rocks, Hodgson Road sw of Kalannie, 13 Sep. 2013, G.Brockman (GBB3218) (PERTH); Coorow - Greenhead Road, corner of Midlands Road, 2 km s of Coorow, 5 Sep 2010, G.Brockman (GBB2624) (PERTH).

5. *Diuris suffusa* D.L.Jones & C.J.French, *sp. nov.*
With affinity to *Diuris refracta* D.L.Jones & C.J.French but differing by smaller flowers (*D. suffusa* 15-25 mm across *cf. D. refracta* 20-30 mm across), which are more crowded (widely spaced in *D. refracta*) and much paler coloured (*D. suffusa* cream to creamy yellow with light-brown to red-brown markings *cf. D. refracta* wholly yellow with reddish petal stalks and reddish tips on the labellum lobes) and the tip of the dorsal sepal and the lateral sepals are shallowly recurved (strongly recurved in *D. refracta*).

Type: Western Australia. Trayning – Bencubbin Road, 7.1 km north of Trayning Rail crossing, 22 Aug. 1999, C.J.French 1620 (holo CANB 624811; iso MEL, NSW, PERTH).

Illustration: Brown, Dixon, French & Brockman (2013), page 217 as *Diuris* sp. "Wyalkatchem".

Description: Leaves basal, semi-erect, conduplicate, two to three, linear to linear-lanceolate, 10-20 cm long, 4-8 mm wide. Scape 15-30 cm tall, slender, green, one-seven-flowered. Pedicels 10-30 mm long, slender. Flowers porrect, 20-27 mm long, 15-25 mm across, cream to creamy yellow with light-brown to red-brown markings, the exterior surface of all segments lightly stained with red-brown; petals mainly cream to pale yellow with light blotchy markings, dorsal sepal and labellum lateral lobes yellow marked and suffused with red-brown, midlobe heavily marked with brown or red-brown, lateral sepals reddish-brown with green tips. Dorsal sepal erect, shallowly recurved towards the apex, transversely ovate, 5-8 mm long, 7-10 mm wide, margins irregular. Lateral sepals deflexed, crossed and shallowly recurved, narrowly oblong, 9-16 mm long, 1.5-3 mm wide, falcate. Petals obliquely erect, divergent, 9-15 mm long; claw linear, 3-4.5 mm long, c. 1 mm wide, reddish-brown; lamina oblong elliptic to elliptic, 8-13 mm long, 5-8 mm wide. Labellum 4-6 mm long, porrect, deeply 3-lobed; lateral lobes spreading widely, upper margins irregular, asymmetrically oblong-ovate, 4-6 mm long, 3-4 mm wide; midlobe convex, the margins sharply downcurved, wedge-shaped when flattened, 4-6 mm long, 5-6 mm wide; apex entire or emarginate. Labellum callus consisting of a single yellow ridge 3-4 mm long, smooth. Column porrect from the end of the ovary, c. 3 mm long, c. 2.3 mm wide. Column wings lanceolate, c. 3 mm long, c. 1.2 mm wide, cream with irregular margins. Anther narrowly ovate, c. 3 mm long, c. 1.3 mm wide, cream with brown markings. Pollinarium c. 2.7 mm long, c. 2 mm wide; viscidium elliptic, c. 0.6 mm long; pollinia clavate, c. 2.5 mm long, white, mealy. Stigma cordate to quadrate, c. 2.5 mm long, c. 2 mm wide. Capsules not seen.



Diuris suffusa
Namalcatching Reserve
210999

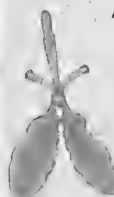


Diuris suffusa
Namalcatching Reserve
210999

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Distribution and ecology: Restricted to a relatively small, more or less rectangular area between Dowerin and Trayning, extending north to Koorda and Bencubbin. It grows in low shrubland merging into heath with scattered eucalypts in the higher parts. The soil is sandy clay that becomes moist to wet on the lower sites. The orchid also persists in remnant shrubby road verge over gravelly loam. It flowers freely in the absence of fire. Flowering occurs mid to late August and September.

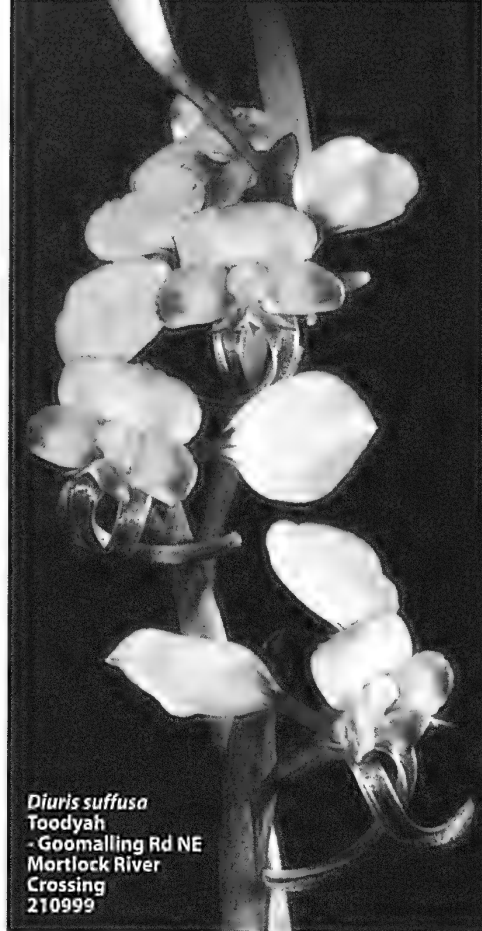
Recognition: Characterised by relatively late flowering habit for a northern species of the *D. corymbosa* complex, small flowers (15-25 mm across) which are cream to creamy yellow with light-brown to red-brown markings, the petal laminae cream to creamy yellow with light blotchy markings, the lateral sepals crossed and shallowly recurved.

Similar species: *Diuris refracta* typically has larger, widely spaced flowers that are much more brightly coloured, lacking blotches and suffusions in the petals and dorsal sepal and the tip of the dorsal sepal and the lateral sepals themselves are much more strongly recurved. In the western part of its range *D. suffusa* grows close to *D. corymbosa* which is distinguished by its earlier flowering period, larger brightly coloured flowers, narrower petal laminae and deflexed (not recurved) lateral sepals. *Diuris pallenscens*, also described as new in this paper, is somewhat similar to *D. suffusa* and flowers at a similar time but has a more north-westerly distribution, pale yellow flowers with light-brown to red-brown markings and the sepals are strongly recurved.

Conservation status: Locally common within a restricted area and conserved in Namalcatching Nature Reserve to the west of Wyalkatchem.

Etymology: The Latin *suffusus*, suffuse, tinged, in reference to the pale flowers lightly tinged or stained with darker colours.

Selected specimens: WESTERN AUSTRALIA. Namalcatching Nature Reserve, 11 Sep. 2004, C.J.French (CJF-5831) (CANB); Dowerin - Wyalkatchem Road, 4 k e Wyalkatchem Service Station, 11 Sep. 2004, C.J.French (CJF-5835) (CANB); Wyalkatchem - Trayning Road, 8.6 k e Wyalkatchem Service Station, 11 Sep. 2004, C.J.French (CJF-5839) (CANB); Namalcatching Reserve. Dowerin-Wyalkatchem Road, 20 km w of Wyalkatchem, 21 Aug. 1999, C.J.French (CJF-1611) (CANB).



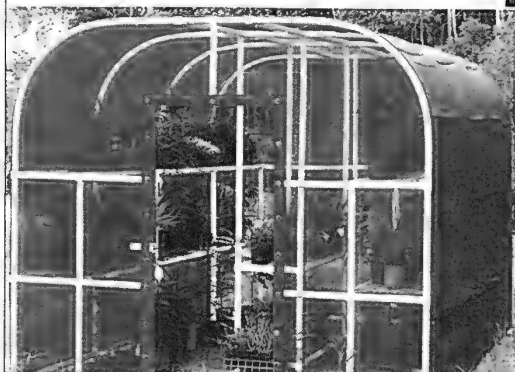
Diuris suffusa
Toodyah
- Goomalling Rd NE
Mortlock River
Crossing
210999



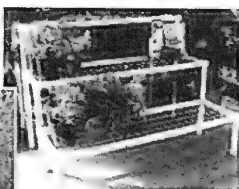
Diuris suffusa
Toodyah
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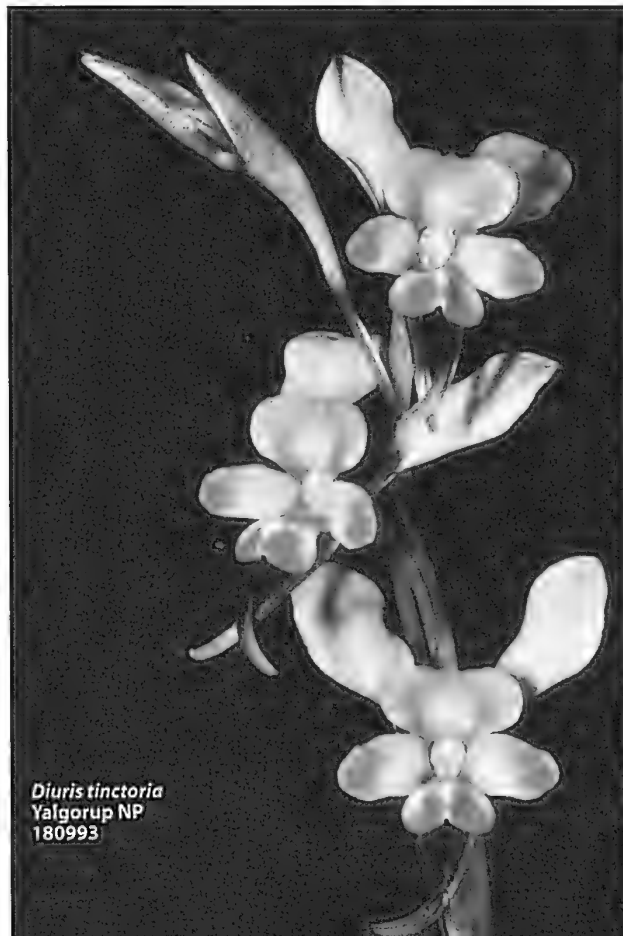
6. *Diuris tinctoria* D.L.Jones & C.J.French, *sp. nov.*

With affinity to *Diuris jonesii* C.J.French & G.Brockman, but differing by its pale yellow flowers heavily suffused with light brown with an occasional trace of purple in the labellum callus (*D. jonesii* flowers are brownish yellow heavily suffused with red brown, the labellum midlobe purple); it also has affinity with *D. corymbosa* Lindley, but differs by its taller habit and pale yellow flowers that are heavily marked with brown (*D. corymbosa* has bright yellow, brown and purple flowers).

Type: Western Australia. Darling District: Yabberup, opposite hall, 12 Sept. 1997, *D.L.Jones 15508* & *B.E.Jones* (holo CANB (CBG9908805).

Illustrations: Hoffmann & Brown (2011), Page 464 as *Diuris* sp. "Sandplain". Brown, Dixon, French & Brockman (2013), Page 216, as *Diuris* sp "Sandplain".

Description: *Leaves* two or three, linear to linear-lanceolate, 10-30 cm long, 4-12 mm wide. *Scape* 20-60 cm tall, two-five-flowered. *Pedicels* 5-30 mm long. *Flowers* porrect, 30-40 mm across, pale yellow heavily suffused with light brown, yellow towards the centre of the flower with occasional trace of purple in the labellum callus, the exterior of the petal laminae usually wholly reddish brown; petals yellow suffused with light brown, dorsal sepal and labellum reddish brown, lateral sepals reddish brown with green tips. *Dorsal sepal* transversely elliptic, 10-12 mm long, 10-14 mm wide, apiculate; dorsal margins irregularly and appearing shortly toothed. *Lateral sepals* deflexed, not recurved, parallel or crossed, narrowly oblong to ensiform, 15-24 mm long, 2-3 mm wide, straight or slightly falcate. *Petals* obliquely erect, 16-24 mm long; claw linear, 4.5-6 mm long, straight or curved, blackish; *lamina* oblong-elliptic to ovate, 12-20 mm long, 8-12 mm wide. *Labellum* 8-10 mm long, porrect with a downcurved apex, deeply 3-lobed; lateral lobes spreading widely, not recurved, asymmetrically oblong-ovate, 7-10 mm long, 4-6 mm wide, falcate; outer margins entire; midlobe flattish to convex, the margins shallowly downcurved, cuneate when flattened, 7-9 mm long, 6-9 mm wide, narrow at the base then widely flared; anterior margins entire or appearing bluntly toothed. *Labellum callus* consisting of a single ridge 5-7 mm long, smooth, centrally yellow surrounded with dark red-brown. *Column* porrect from the end of the ovary, 4-4.5 mm long, 3.5-4 mm wide. *Column wings* oblanceolate, c. 4.5 mm long, c. 1.5 mm wide, cream with brownish irregularly erose margins. *Anther* narrowly ovate, c. 4 mm long, c. 2.5 mm wide, cream to brown. *Pollinarium* c. 3.8 mm long, c. 2.5 mm wide. *Stigma* cordate to quadrate, c. 3 mm long, c. 2.5 mm wide. *Capsules* obovoid, 15-20 mm long, 6-8 mm wide, ribbed.



Distribution and ecology: From Lake Clifton south of Mandurah to Bunbury. It grows in *Banksia* woodland and shrubby Jarrah-Marri forest in sand over limestone. It flowers freely without fire. Flowering occurs early September to October.

Recognition: Characterised by tall habit and large (30-40 mm across) pale yellow flowers heavily suffused with light brown with an occasional trace of purple in the labellum callus.

Similar species: The range of *Diuris tinctoria* has some overlap with that of *D. magnifica* but it can be readily distinguished from that taxon by its smaller less colourful flowers and taller habit.

Notes: This species flowers freely only in wetter than average seasons.

Conservation status: Uncommon but conserved in Yalgorup National Park; threatened in some sites by weeds and urban encroachment.

Etymology: The Latin *tinctorius*, tinged, dyed, in reference to the colour patterns in the flowers.

Selected specimens: Yalgorup National Park, ca 50km s of Mandurah, Old Coast Road, 18 Sep. 1993, C.J.French (DLJ12028) (CANB); Coronation Road, 1.8 km from Old Coast Road, 5 Sep. 2004, C.J.French (CJF5801) (CANB); Riverdale Road, opposite East Break. 2.95 km w of Old Coast Road, 5 Sep. 2004, C.J.French (CJF5824) (CANB).

NOTE

Field studies have revealed two new *Diuris* species growing in the Geraldton Sandplains bio-region between Northampton and north of the Vermin Proof Fence at the Zuytdorp Cliffs. Due to their flowering times and somewhat remote location, these species are seen infrequently, particularly in drier seasons when they flower poorly.

7. *Diuris carecta* D.L.Jones & C.J.French, *sp. nov.*

With affinity to *Diuris corymbosa* Lindley but differing by the more northerly distribution, taller plants and flowers with an untidy appearance in which the dorsal sepal recurves in the upper half, the petal blades recurve strongly and have irregularly wavy margins and the lateral sepals are usually crossed and recurved beneath the labellum. By contrast *D. corymbosa* has a southerly distribution (Gingin to Bunbury, inland to Brookton), flowers with a much neater appearance with the dorsal sepal erect, the petal margins flat and the lateral sepals deflexed downwards and not recurved.

Type: Western Australia. Irwin District. Track parallel to Great Northern Highway, south of Binu wheat bin, 30 Aug. 2004, C.J.French 5765 (holo CANB 653932; iso PERTH).

Illustration: Brown, Dixon, French & Brockman (2013), page 214 as *Diuris* sp. "Murchison River".

Description: Leaves two or three, linear to linear-lanceolate, 15-25 cm long, 6-14 mm wide. Scape 25-45 cm tall, one-six-flowered. Pedicels 20-40 mm long. Flowers porrect, 30-40 mm long, 20-30 mm across, yellow with brown to red-brown suffusions, some brown staining on the exterior of the segments; petals mostly yellow, the dorsal sepal yellow with brown suffusions and the labellum with strong brown to red-brown suffusions, lateral sepals greenish-brown with green tips. Dorsal sepal transversely ovate, 8-12 mm long, 10-16 mm wide, erect or recurved in the upper half. Lateral sepals deflexed, often crossed and recurved beneath the labellum, narrowly oblong, 13-18 mm long, 2-2.5 mm wide, falcate. Petals obliquely erect, the blades often recurved, 15-20 mm long; claw linear, 3-4 mm long, c. 1.5 mm wide, curved, reddish-brown; lamina broadly elliptic, 13-15 mm long, 10-14 mm wide, the margins sometimes irregularly wavy. Labellum 7-10 mm long, porrect, the apex downcurved, deeply 3-lobed; lateral lobes spreading, asymmetrically ovate-oblong, 8-10 mm long, 4-6 mm wide; midlobe convex, margins strongly downcurved, broadly cuneate when flattened, 7-10 mm long, 8-12 mm wide, base relatively broad; anterior margins entire or slightly irregular; apex emarginate. Labellum callus consisting of a single yellow ridge about 4 mm long, smooth. Column porrect from the end of the ovary, 3.5-4 mm long, c. 3 mm wide. Column wings lanceolate, c. 3.5 mm long, c. 1.3 mm wide, cream to yellowish with irregular margins. Anther narrowly ovate, c. 3.5 mm long, c. 2.2 mm wide, cream with brown markings. Pollinarium c. 3 mm long, c. 2.2 mm wide. Stigma cordate to quadrate, c. 3 mm long, c. 2 mm wide. Capsules not seen.

Distribution and ecology: Ranging from south of the State Barrier Fence in the Murchison region and extending south to Binu and inland to East Yuna Nature Reserve. This orchid grows in wetter sites among sedges in *Acacia* shrubland, mixed shrubland and York Gum (*Eucalyptus loxophleba*) woodland. The soils are red sandy clay loam, gravelly clay



loam, yellow sand and brown clay, usually developed on sandstone. This orchid flowers freely in the absence of fire. Flowering occurs late August to early October.

Recognition: Characterised by late flowering period, tall habit, up to six flowers in the inflorescence, the petals mostly yellow, the dorsal sepal yellow with brown suffusions and the labellum with strong brown to red-brown suffusions.

Additionally the upper part of the dorsal sepal recurves, the petal blades recurve and the lateral sepals are usually crossed and recurved beneath the labellum. The petals look untidy because the margins of the blades are irregularly wavy to varying degrees.

Similar species: *Diuris carecta* is most similar to *D. corymbosa* but grows in wetter habitats, flowers later and is much taller. The new species also has some similarities to *Diuris oraria* (described below) but differs in having much taller habit, more flowers in the raceme, a more inland distribution (with no range overlap observed to date) and later flowering time (*D. oraria* is generally in very late flower when *D. carecta* is starting to flower).

Conservation status: Poorly known but conserved in Kalbarri National Park and East Yuna Nature Reserve.

Notes: This species has been known by the tag name of *Diuris "sedgicola"*. At the southern end of the distribution of *D. carecta* there is some overlap with *Diuris recurva* and *D. refracta*, with both species having smaller, paler flowers. During drier seasons, *Diuris carecta* flowers very poorly, often not flowering at all, whereas it flowers abundantly in wetter seasons. A population with similar features from a granite rock adjacent to the Vermin Fence north of the Hyden-Norseman road is in need of further study.

Etymology: From the Latin *carectum*, a sedgy place, in reference to the preference of this species to grow up through the protection of sedges.

Other specimens: WESTERN AUSTRALIA. Ajana Back Road, 5.2 km from Northwest Coastal Highway, 28 Aug. 2001, *C.J.French 2980* (CANB); Northwest Coastal Highway, 16.7 km N of Galena Bridge, 1 Sept. 2001, *C.J.French 3002* (CANB, MEL, PERTH); Ogilvie West Road, 150 m from Box Road, 29 Aug. 2004, *C.J.French 5714* (CANB); East Yuna School Site, 30 Aug. 2004, *C.J.French 5750* (CANB); East Yuna Reserve Breakaways, 30 Aug. 2004, *C.J.French 5758* (CANB).

Diuris carecta
East Yuna NR
300804



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Diuris carecta
S of Barrier Fence
- Murchison
250803



8. *Diuris oraria* D.L.Jones & C.J.French, *sp. nov.*

With affinity to *D. tinkeri* D.L.Jones & C.J.French but differing by its fewer flowers (one to four per raceme, up to seven for *D. tinkeri*), smaller flowers (*D. oraria* 20-25 mm across, cf. *D. tinkeri* 25-30 mm across), which are mostly yellow with red-brown and purple markings (*D. tinkeri* is mostly yellow with reddish petal stalks and reddish-purple to purple suffusions on the labellum) shorter, wider, broadly elliptical to orbicular petal blades, shorter, broader dorsal sepal, and shorter labellum. It also differs from *D. corymbosa* Lindley which flowers much later (August-October) has larger more colourful flowers, longer dorsal sepal and flowers with a much neater appearance with the dorsal sepal erect, the petal margins flat and the lateral sepals deflexed downwards and not recurved.

Type: Western Australia. Irwin District, 0.9-1.2 km N of State Barrier Fence, 2.4 km E of W end of fence, 1 Aug. 1999, C.J.French 1548a (holo CANB 624869).

Illustration: Brown, Dixon, French & Brockman (2013), page 218 as *Diuris* sp. "Zuytdorp Cliffs".

Description: *Leaves* two or three, linear to linear-lanceolate, 10-15 cm long, 5-10 mm wide. *Scape* 15-30 cm tall, one-four-flowered. *Pedicels* 20-30 mm long. *Flowers* porrect, 25-30 mm long, 20-25 mm across, mostly yellow with red-brown and purple markings, the exterior surface of all segments stained with red-brown; petals and dorsal sepal yellow, labellum lateral lobes yellow with brownish tips, midlobe yellow with red-brown and purple markings, lateral sepals brownish with green tips. *Dorsal sepal* transversely ovate, 7-10 mm long, 12-15 mm wide. *Lateral sepals* stiffly deflexed, straight or slightly recurved, parallel or crossed, narrowly oblong, 13-18 mm long, 2.5-3 mm wide, slightly falcate. *Petals* obliquely erect, sometimes shallowly recurved, divergent, 16-20 mm long; claw linear, 3-4 mm long, 1-1.5 mm wide, straight or curved, reddish-brown; lamina broadly elliptic to orbicular, 12-16 mm long, 9-13 mm wide. *Labellum* 7-10 mm long, porrect with a decurved apex, deeply 3-lobed; lateral lobes spreading widely, tips straight or slightly recurved, asymmetrically oblong, 7-9 mm long, 4-6 mm wide; midlobe convex, margins strongly downcurved, broadly wedge-shaped when flattened, 7-9 mm long, 7-9 mm wide, narrow at the base then widely flared; anterior margins entire; apex entire or slightly emarginate. *Labellum callus* consisting of a single yellow ridge 3-4 mm long, smooth. *Column* porrect from the end of the ovary, 3.5-4 mm long, c. 3 mm wide. *Column wings* lanceolate, c. 4 mm long, c. 1.5 mm wide, cream to yellowish with irregular margins. *Anthier* narrowly ovate, c. 4 mm long, c. 2.5 mm wide, cream with brownish markings. *Pollinarium* c. 4 mm long, c. 2.5 mm wide. *Stigma* cordate to quadrate, c. 3 mm long, c. 2 mm wide. *Capsules* not seen.

Distribution and ecology: Coastal and near-coastal areas (up to circa 5 km from the coast) from north of State Barrier Fence at Zuytdorp Cliffs to south of Kalbarri, possibly extending south to Port Gregory. It grows in sedge-dominated sandplain in shallow freely draining sand over limestone. The plants flower freely in the absence of fire. Flowering occurs late July to late August. The orchids are generally found growing up through the protection of the sedges.

Recognition: Characterised by early flowering period, one to four-flowered scape, smallish flowers (20-25 mm across) which are mainly yellow with red-brown markings in the labellum, broadly elliptical to orbicular petal laminae, short broad dorsal sepal and short labellum with broad lateral lobes. Its northern coastal and near-coastal distribution in sedge-dominated habitat on limestone is also notable.

Similar species: This species has similarities to *Diuris tinkeri* but generally has smaller flowers with a paler yellow base colouration, much more rounded laminae on the petals and a short broad dorsal sepal. Both species share a brightly coloured, often purple, labellum midlobe. It also has some similarities to *Diuris carecta* (also described in this paper)



Diuris oraria
Zuytdorp Cliffs
010899



Diuris oraria
Zuytdorp Cliffs
010899

but differs in having much shorter habit, fewer flowers, a near-coastal distribution (with no range overlap observed to date) and earlier flowering time (*D. oraria* is generally in very late flower when *D. carecta* is starting to flower).

Notes: *Diuris oraria* is less common at the southern end of its distribution but has some overlap with *D. recurva* and *D. refracta*, with both of these species having smaller, paler flowers. It is common amongst the sedges at the Zuytdorp Cliffs, just north of the State Barrier Fence but is rarely seen due to its remote location and early flowering period.

Conservation status: Poorly known but conserved in Kalbarri National Park and Zuytdorp Nature Reserve.

Etymology: The Latin *orarius*, of the coast, in reference to its coastal and near-coastal distribution.

Other specimens: WESTERN AUSTRALIA. Geraldton-Northampton Road, 7 Aug. 1990, *A.P.Brown* 1002 (CANB); Mushroom Rock car park, 5 Aug. 2000, *C.J.French* 2216 (CANB); 0.9-1.2 km n of State Barrier Fence, 2.4 km e of W end of fence, 1 Aug. 1999, *C.J.French* 1548b (CANB 624870); Bishop Gully Road, 5.5 km from Port Gregory-Northampton road, 11 Aug. 2001, *C.J.French* 2866 (herb. C.J.French).

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- <http://florabase.dpaw.wa.gov.au/> FloraBase, Western Australian Herbarium, Department of Parks and Wildlife, Government of Western Australia.

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Thelymitra abrupta,
front-on single flower,
The Marshes NFR,
081115 (JN)

Thelymitra abrupta a new species of Sun Orchid (*Orchidaceae*) from South Australia

by Robert J. Bates

Abstract

Thelymitra abrupta, a member of the blue spotted *T. ixioides* Sw. complex is here described as new. Notes are provided on its distribution, ecology and conservation status; its distinguishing features are compared with those of allied taxa.

Key Words

Thelymitra, abrupta, new species, orchid, South Australia, Australian Flora.

Introduction

Many groups of Australian *Thelymitra* have been revised by J. Jeanes in recent times (Jeanes (2004 etc.) but the group of species and hybrids centred around *T. ixioides* Sw. the first named species of the complex is not one of these although Bates (2010, 2011, 2013) has named new South Australian taxa and mentioned others yet to be published. Bates & Weber (1990) treated only *T. ixioides* and its hybrid with an unknown member of the *T. pauciflora* complex i.e. *T. truncata* R.S. Rogers, as occurring in South Australia. They did however suggest that *T. ixioides* in the narrow sense might have been restricted to the eastern states and that all SA material belonged to other taxa including *T. juncifolia* Lindl. They illustrated several named hybrids belonging to the group including *T. irregularis* Nicholls and *T. merraniae* Nicholls. The taxon named here has been known from swamps south of Adelaide since the 1970's when photographs were first taken, but a lack of good collections prevented it being described. Although collections of it at the State Herbarium of South Australia (AD) are scrappy they do include both spirit and pressed material. Known populations of the new species were thought to have disappeared by 2012 when plants were relocated in native forest reserves near Mount Gambier. In 2014 a large population was found south of Mount Burr by local Sheryl Holiday and June Niejalke. The size of this population and the lack of variation in the flowers indicated that they were not hybrids. The rediscovery allowed collections to be made and the species to be published.

Materials and methods

The description below was made from fresh material, preserved specimens and photographs. All collections cited (or photographs of them) were seen by the author.

Taxonomy

Thelymitra abrupta R.J. Bates **sp. nov.** With affinity to *Thelymitra juncifolia* Lindley but differing in its non-striated leaf base, long, needle like point on the floral bract and fewer, smaller, darker blue flowers with more deeply cupped sepals. The column structure of *T. abrupta* is quite different from that of *T. juncifolia* in lacking either the yellow crest on the post anther lobe as in *T. juncifolia* or a yellow tube-like post anther lobe as in *T. truncata*. Instead *T. abrupta* has a dark blue post-anther-lobe with its apex red edged appearing to be neatly sliced off. The trichome tuft of the new species is often irregular, the individual trichomes shorter than those of related taxa.

Type: South Australia, South-east region, The Marshes Native Forest Reserve (south of Mount Burr) 8 Nov 2015, J. Niejalke BSB739-1979 (holo AD).

Description:

Tuberous, terrestrial, vernal orchid 10 to 22 cm. tall. *Tuber not seen.* Leaf linear, erect, 4-10 cm long, c. 2 mm wide, dull green with pink tints, canaliculate with an angular dorsal rib. *Scape* filiform, 10-22 cm tall, c. 0.8 mm wide, pale pink with carmine base. *Inflorescence* consisting of one to four tiny flowers, the rachis pink. *Sterile bracts* two, lanceolate, acuminate, 6-10 mm long, c. 2 mm wide, green, sheathing. *Fertile bracts* similar but more acuminate often sharply so, 5-11 mm long, 3-5 mm wide, green, with pink tints, closely sheathing the pedicel. *Pedicels* 1-5 mm long, slender. *Ovary* narrow-obovoid, 5-7 mm long, 2-2.5 mm wide, greenish, strongly ribbed. *Flowers* 8-12 mm across, purple-blue, with 5-10 darker blue lines or striations; opening tardily on warm, humid days. *Perianth segments* 5-7 mm long, 2.5-3 mm wide, concave to convex according to conditions, acute; *sepals* pink or brown outside with white edges; *dorsal sepal* ovate, erect, subacute, with a cluster of blue dots basally; slightly longer than other segments, *lateral sepals* ovate-lanceolate, slightly asymmetric, subacute, mostly unspotted; *petals* ovate, larger, rounder and thinner textured than sepals, obtuse, more intensely blue than sepals and with irregular, darker blue spots and lines. *Labellum* similar to but smaller than other segments, lanceolate to ovate-lanceolate, with sparse darker dots, apex sometimes mucronulate. *Column* erect from end of ovary, curved forward at the middle, white or palest blue, 4-5 mm long, 2-2.5 mm wide; *post-anther-lobe*, only partly hooding the anther, c. 1.3 mm long, 1 mm wide, dark blue with an angular, red apex, not inflated, ending abruptly as if sliced off; *apex* neither thickened or notched; *auxillary lobes* absent. *Lateral lobes* converging or irregular 0.5-0.8 mm long, digitiform, porrect at base then sharply upswep, or straight in the irregular forms. *Trichomes* terminal, white, sparse and variable, the individual trichomes c. 0.4 mm long, often malformed; *anther* inserted midway along the column, 2-2.4 mm long, 1.2 mm wide, collective produced into an apical beak 0.3 mm long; *pollinarium* 1.3-1.5 mm long; *viscidium* more or less circular, c. 0.4 mm diam.; *pollinia* friable, mealy, white. *Stigma* at base of column, quadrate, c. 1.2 mm wide, *margins* untidy. *Capsules* not seen.

Distribution and ecology: Endemic to South Australia on the Fleurieu Peninsula south of Adelaide and in the Lower South-east region near Mount Gambier; possibly also in Victoria's Grampians where similar habitat exists. Favours sandy heath around swamps and peat bogs; mostly seen on firebreaks and tracksides. Associated with scattered blackwood trees. Has also been observed on bushfire scorched low heathland.

Flowering has been observed in late October and early November but the flowers open only briefly.

Pollination biology not well studied but apparently self-pollination is the norm. Known only from four different conservation reserves between Adelaide and Mount Gambier but perhaps no longer present in some of them.

Recognition: Characterised by the few, tiny, deep blue or purple-blue flowers with their darker spots and lines; also by features of the column including the dark blue post-anther-lobe with its neatly cut, red apex and also by the long, upturned column arms with their tiny, sparse white trichomes. There are no similar species.

Notes: It has been suggested that the taxon is of hybrid origin with *Thelymitra ixioides* or *T. juncifolia* and *T. cyanapicata* Jeanes as putative parents but the latter species does not occur in the South-east region and with a population of forty plants observed by Niejalke *et al* at the type location it is certainly self-perpetuating. Apart from the blue spots, *T. abrupta* shares no features with *T. ixioides*. *T. juncifolia* too was once thought to be a hybrid (between *T. ixioides* and *T. pauciflora*); (Clements 1982, 1989).

Conservation status: Certainly rare and probably endangered as northern populations may have already disappeared.

Etymology: of Latin origin *abrupt* as in suddenly cut off, a reference to the neatly sliced off appearance of the post anther lobe.

Acknowledgements

I am grateful to members of the Native Orchid Society of South Australia (NOSSA) who photographed and/or collected the species, in particular June Niejalke, Sheryl Holliday and John Lawson. All images from The Marshes Native Forest Reserve (south of Mount Burr) were taken by June Niejalke, with the example from Glenshera Swamp photographed by the author.

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Robert J. Bates

Fairview Park SA 5126

Email: bobbates63@hotmail.com



Thelymitra abrupta,
single flower,
The Marshes NFR,
081115 (JN)



Thelymitra abrupta,
column detail,
The Marshes NFR,
081115 (JN)



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Thelymitra abrupta,
back of flower,
The Marshes NFR,
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Thelymitra abrupta,
The Marshes Native
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AOR 039

Laelia purpurata forma alba 'Louanne'

by Bill Dobson

It would be fifteen years or so since David Banks gave me a small division of this choice albino form of *Laelia purpurata* forma alba 'Louanne'. David imported a bunch of various advanced line-bred seedlings of the Brazilian species back in 1997, including a number of unflowered pure white flowered forms.

He subsequently bloomed these out and all the albino plants (that were more yellowish-green in their foliage, lacking anthocyanin) indeed flowered white. He selected the best from the batch and named it after his wife, Louanne.

In late 2014 it bloomed with 64 flowers in a 250 mm black squat Port Pot. On that blooming it received an Award of Cultural Merit (82 points) from the Orchid Society of

New South Wales and the Australian Orchid Council (award #5150) on 15 December 2014.

After flowering I cut off half of the roots (similar to my treatment of *Dendrobium speciosum*) and put it in a 450 mm garden sieve.

In December 2015 it produced 91 flowers (I was hoping for 100!). Ah well, later this year who knows, but I will have to break it up after flowering as it is becoming just too big to handle! ■

Bill Dobson

Cromer, NSW

Email: bdobson@optusnet.com.au



Laelia purpurata
forma alba
'Louanne'

Medal win for CSIRO orchid hunter, Mark Clements

by Andrea Wild

“Orchids seem to have an almost mystical power over people,” says Mark Clements, whose contribution to science was recognised by the Royal Horticultural Society in late February 2016, with the award of the prestigious Westonbirt Orchid Medal in London.

Following a stint as a wool classer in outback South Australia, Mark began working with orchids more than 40 years ago.

“Orchids are the butterflies of the plant world,” he says. “They inspired collectors in the Victorian era and are very popular as pot plants. Vanilla is actually the seed pod of an orchid species. But to me, orchids have fascinating life histories and are very interesting scientifically.”

Working at Centre for Australian National Biodiversity Research, Mark has collected and curated tens of thousands of specimens representing more than 1300 species of Australian native orchids. These specimens are housed in the Australian National Herbarium.

His life's work has helped unravel the evolutionary relationships among orchids, understand their biodiversity and improve their conservation and management. Paying close attention to the complex biology of orchids has enabled Mark to work with rare orchids. In the 1980s, his knowledge helped save England's infamous Lady Slipper Orchid, *Cypripedium calceolus*.

Harvested from the wild for flower markets since Victorian times, a single plant remained in Yorkshire. Possibly hundreds of years old, it had held the title of last survivor for at least 30 years and was protected by security guards during its growing and flowering season. Efforts to propagate it had failed.

Orchid seeds are very small. Tiny in fact. Containing little energy to support the germinating plant, the seeds parasitise a kind of fungus known as mycorrhizae, stealing nutrition from the fungus.

Working at Kew Gardens, Mark used his knowledge of orchid biology to cultivate the lady slipper and several other rare species.

“You need to understand the plant and where it likes to live to be able to propagate it successfully,” he says. “Today there are more than a dozen established wild populations of Lady Slipper orchids.”

Orchids are the world's largest group of flowering plants. Australia's 1300 or so species of native orchids grow all over the country, except in the central deserts, and around 95 per cent occur nowhere else on earth.

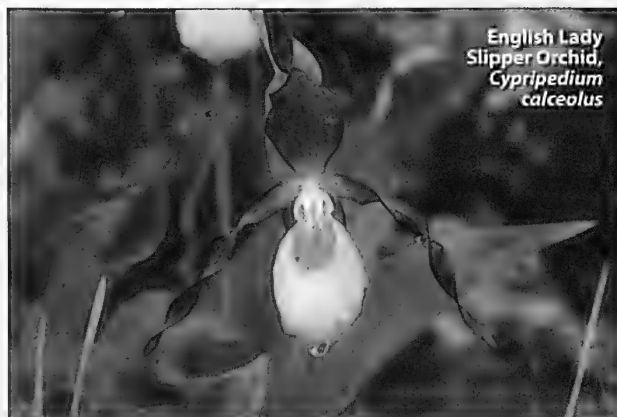
The presence of orchids is a very good indicator of the health of an ecosystem. Finding a flowering orchid in the wild

is a special moment. It lifts the spirit and reminds us what truly matters about biodiversity; orchids truly are a diverse bunch. Some plants grow as epiphytes, clinging to the trunks and branches of trees. Some flowers mimic female flies to attract males as pollinators, others have big colourful blooms to attract bees; some smell so revolting you couldn't go near them.

The Centre for Australian National Biodiversity Research in Canberra, where Mark spends his days celebrating the biodiversity of orchids, is a joint venture between Parks Australia's Australian National Botanic Gardens and CSIRO.



Westonbirt Orchid Medal winner Mark Clements, with his medal. Photo: © RHS



English Lady Slipper Orchid, *Cypripedium calceolus*

Andrea Wild

National Research Collections Australia

CSIRO, Canberra ACT

Email: Andrea.Wild@csiro.au



Above: Floral dissection card of *Dockrillia caudiculata* from Papua New Guinea. Photo: David Banks

Left: Mark Clements with flowering plant of *Dockrillia caudiculata*. Photo: David Banks

Below: *Dockrillia caudiculata*. Plant & Photo: David Banks





Above left: Orchid herbarium specimens stored in spirit (ethanol) vials at the Australian National Herbarium. Photo: Andrea Wild



Above right: Mark Clements amongst part of the living orchid collection at CSIRO, holding *Epigeneium nakaharae*. Photo: Andrea Wild

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GROWING ORCHIDS FROM SEED

by Philip Seaton and
Margaret Ramsay

Written for the amateur and the professional without access to sophisticated laboratory equipment and chemicals, 'Growing Orchids from Seed' contains all you need to know to become an expert!

Careful guidelines are given for buying and making equipment, pollinating orchid flowers, harvesting and storing seed, successful germination, transplanting seedlings, and growing them on to healthy plants.

Eighty-eight lavishly illustrated pages of coloured drawings and photographs explain everything from selecting the right kit, through to planting your own seed-raised plants in the greenhouse, teaching you step-by-step how to grow orchids confidently, successfully and professionally.

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ORCHID SPECIES OF THE SHOALHAVEN: NSW Australia by Alan W. Stephenson

Alan Stephenson lives in Nowra and is well placed to give the first botanical treatment of the native orchids of the Shoalhaven region. He has extended the distribution ranges of a number of uncommon and rare species, as well as discovering new taxa. This 68 page book is packed with both information and superb photography, almost exclusively taken by the author. All of the recorded orchid species native to the region are included and illustrated.

The introductory chapters discuss the area covered by this book, the structure of the orchid plants, their natural habitats, parts of an orchid flower, orchid structure and the pollination of orchids. This is followed by the main section of the book that alphabetically lists and

discusses each species, with information such as Common Names, Recent Synonyms, Flowering Time in the wild, plus a brief description of the plant, flowers and preferred habitat. There are many terrestrial species fully covered as well as a number of epiphytic and lithophytic genera that are found in the area.

The quality of the printing and colour reproductions are sparking. This is a wonderful field guide that will aid even the most novice naturalist or native orchid enthusiast and confidently assist them in identifying examples they encounter in the field. It represents excellent value, as it also covers many species found naturally along the East Coast of New South Wales.

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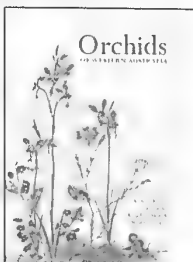
ORCHIDS OF WESTERN AUSTRALIA

by Andrew Brown, Pat Dundas,
Kingsley Dixon & Stephen Hopper

Written by three of Western Australia's most prominent orchidologists and featuring over 200 full-page, colour illustrations by renowned botanical artist Pat Dundas, *Orchids of Western Australia* is the first modern text cataloguing all 409 known species.

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ORCHIDS IN YOUR GARDEN How to grow orchids in the backyard by Robert Friend

It sounds too good to be true, but orchids are as easy to grow in the backyard as a lawn or a bed of roses. Despite their exotic reputation, the everyday gardener can grow orchids without special pots or greenhouses.

The book shows you how to introduce orchids into the garden, by attaching them to trees, fixing them on rocks and walls, or planting them in garden beds. With more than 150,000

species and hybrids of orchids in the world, there are plants suitable for every garden.

Robert Friend draws on a lifetime's experience with orchids to explain how to choose the right orchid for your climate and how to landscape orchids in different types of gardens. Ranging from tropical to cool climate areas, from large acreages to small courtyard gardens, almost every backyard can enjoy the best of one of nature's wonders.

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THE ALLURE OF ORCHIDS by Mark A. Clements

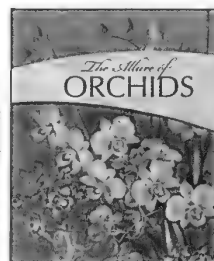
From 1788 when First Fleet artist George Raper painted *Diuris punctata*, the botanical world has been fascinated by Australian orchids. Hundreds of orchid images from the National Library of Australia's collection, with words by Mark Clements from the Australian National Herbarium in Canberra, make *The Allure of Orchids* a must-read for lovers of flowers, original paintings and our indigenous orchids. Many of these unique botanical illustrations are being showcased to a wider audience for the very first time.

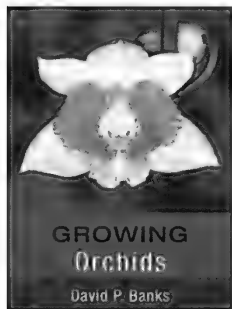
The Allure of Orchids features an essay by internationally recognised orchid expert Mark Clements, accompanied by a portfolio of illustrations, both historical and modern, of this alluring species. In it you will find works by around 25 artists, including the extraordinarily detailed lithographs of early botanical illustrator Ferdinand Bower, Ellis Rowan's beautiful paintings, the delicate watercolours of Margaret Cochrane Scott, and many more. *The Allure of Orchids* is divided into two parts; Terrestrial or ground orchids and Epiphytic or tree dwelling species. Clements says, "These illustrations can be enjoyed simply as works of art and part of our rich and colourful Australian illustrative heritage. But, significantly, they are also part of the scientific record of this country, particularly during the early exploration of the continent."

Interestingly, a lot of the old and traditional Latin botanical names have been used in this work. The author makes a significant number of anecdotal notes and comments throughout the book, to keep the reader fully informed. It is a "must have" book for those interested in Australian orchids and historical botanical art.

159 pages, colour.
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GROWING ORCHIDS

by David P. Banks

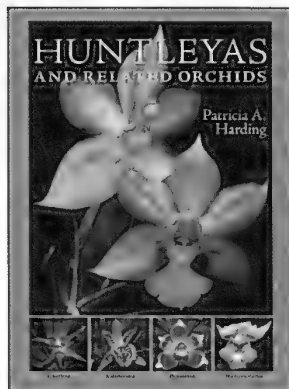
Orchids have fascinated people for years. Breathtakingly beautiful, exotic, and surrounded by mystery, many home gardeners wrongly believe them to be difficult to grow. David P. Banks takes the guesswork out of growing orchids by providing practical advice based on more than 40 years' experience.

Growing Orchids is an up-to-date and informative guide to cultivating these intriguing plants. Included is information on housing orchids, temperature and watering requirements, suitable potting materials, seedling care, and a comprehensive section on orchid propagation.

Discover the world of orchids with the extensive list of 100 different orchid genera and descriptions of over 400 species. More than 100 stunning colour photographs, including many rare and recently discovered species, showcase the tremendous variation found throughout the orchid kingdom. These are the very last new copies, as this 2001 book has been long out of print.

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HUNTLEYS AND RELATED ORCHIDS

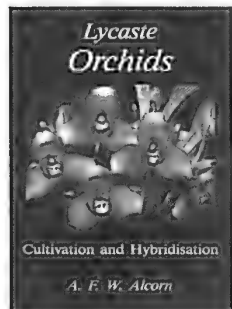
by Patricia A. Harding

Revered by avid orchid collectors for its delightful, star-shaped flowers, *Huntleya* is a small group of orchids found low in the forest. *Huntleya* is a small orchid genus that includes fourteen species. They occur in wet cloud forests at medium altitudes of Guatemala, Costa Rica, South America down to Bolivia. The type species *Huntleya meleagris* also occurs in Trinidad. Besides their striking colours — from deep blue to waxy red, royal purple to almost black — flowers of this group are known for their distinctive shapes, patterns, and textures. As appealing as these lovely tropical orchids are, their identification has been

confused since the first species was described in the mid-1800s. Recent DNA studies have led to a clearer understanding of relationships and, as a result of this clarity, it is now possible to sort out the taxonomic problems and identify the characteristics that set species apart. In this first book devoted to the *Huntleya* alliance, author Patricia Harding presents evidence from the scientific literature, other growers, and her own experience that will enable orchid enthusiasts everywhere to identify their plants and grow them successfully. Patricia A. Harding is an accredited American Orchid Society judge who has been growing and photographing orchids for three decades.

260 pages, 150 colour photos. Hardcover.

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LYCASTE ORCHIDS - Cultivation and Hybridisation

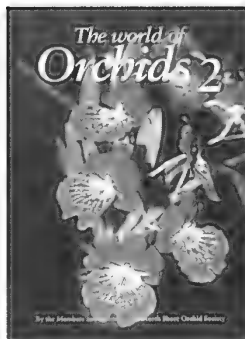
by A.F.W. Alcorn

Lycaste orchids are easy to grow, and they produce flowers that range from the beautiful to the bizarre. No book previously has provided detailed cultural requirements of the Lycaste, and this book should fill that gap, and encourage new growers to take up the cultivation of this beautiful genus. A section on hybridising contains valuable information on inheritance and genetics that will benefit any hybridiser, not just the grower of Lycastes, as well as helpful hints on how to avoid pitfalls in your hybridising program. Michael Hallett, a friend of

Fred Alcorn for a number of years, co-wrote this book with Fred and has completed it posthumously. He has a background in genetics, research and botany, and a passion for plants, especially orchids.

237 pages.
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THE WORLD OF ORCHIDS - 2

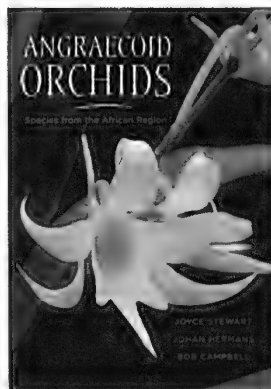
The World of Orchids - 2 has been written by members and friends of the North Shore Orchid Society about orchids grown in Sydney and its environs, and we are indebted to those people for their time and effort.

It has been produced to cover a large range of genera to help not only the novice, but also the experienced grower in their present fields of interest, and to tempt and encourage them to try other genera.

It should be pointed out that the methods of culture used by the authors are those which they themselves have found successful. Growers should try any changes to their own culture gradually and on a few plants first, as orchids respond differently under different conditions.

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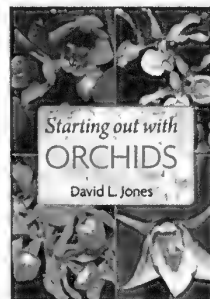
ANGRAECOID ORCHIDS: Species from the African Region

by Joyce Stewart, Johan Hermans, and Bob Campbell

These so-called 'Jewels of Africa' with their sparkling flowers, distinctive growth habit and floriferous nature are much prized and this account, the first to include the Angraecoid orchids of both Africa and Madagascar, is long awaited. It brings together, in a single volume, descriptions of all 690 species in this intriguing group of orchids and will be the essential reference for all Angraecoid orchid enthusiasts for years to come. Including such horticulturally important genera as *Angraecum*, *Aeranthus*, *Aerangis* and *Jumellea*. Stewart, Herman and Campbell have all spent time in various parts of eastern and southern Africa and precise ecological information relating to habitat, altitude preferences and flowering season of individual plants will be particularly helpful to growers. The diagnostic features of each genus are illustrated and over half the species are accompanied by exquisite photographs taken in both wild habitats and in cultivation.

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STARTING OUT WITH ORCHIDS

by David L. Jones

David Jones is arguably one of Australia's most prolific, precise and respected botanical and horticultural authors. The book is divided in two parts. Part One begins with the cultivation chapters, covering Easy Orchids for Beginners, General Cultivation Requirements, Growing Epiphytic Orchids, Growing Terrestrial Orchids, Orchid Pests and Diseases, Housing Your Orchids and Propagating Your Orchids. The information contained within these pages alone is required reading for all beginners through to experienced orchid growers. The text is very easy to read and understand with numerous sound cultivation tips and treatments discussed. There are many excellent and clear line illustrations that help describe terms or highlight diagnostic features. There are over 250 colour photographs.

Part Two discusses the orchids themselves with concise information on each species. They are grouped primarily according to climatic requirements, starting with cool growing orchids progressing to the warm growers, in alphabetical sequence first with terrestrial genera, followed by the epiphytes. Both Australian and exotic species are treated together. For each entry there is specific detailed information on each species, as well as a simple table giving the basic cultivation needs and flowering season. A glossary is also included to explain unfamiliar terms.

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New combinations in the South Australian Orchidaceae

by Robert J. Bates

The following new combinations in the Orchidaceae are necessary to allow for the different taxonomic views held at generic level within these orchids; in most cases specifically so that they can be added to the South Australian and Australian Census of Vascular Plants!

Caladenia conferta ssp. *occidentalis* (R.J. Bates) R.J. Bates **comb. nov.** Basionym *Arachnorchis conferta* ssp. *occidentalis* R.J. Bates *Austral. Orch. Rev.* 81 (1) 43, (2016).

Caladenia diversiflora (R.J. Bates) R.J. Bates **comb. nov.** Basionym *Arachnorchis diversiflora* R.J. Bates *Austral. Orch. Rev.* 81 (1) 45, (2016).

Caladenia viriosa (R.J. Bates) R.J. Bates **comb. nov.** Basionym *Arachnorchis viriosa* R.J. Bates *Austral. Orch. Rev.* 81 (1) 48, (2016).

Corybas minimus (R.J. Bates) R.J. Bates **comb. nov.** Basionym *Corysanthes minima* R.J. Bates *Austral. Orch. Rev.* 80 (5) 43, (2015).

Oligochaetochilus simulans (R.J. Bates) R.J. Bates **comb. nov.** Basionym *Pterostylis simulans* R.J. Bates *Orchadian* 18 (1) 38 (2014).

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– Sydney, NSW

April 30 Dubbo Orchid Society Workshop
– NSW

May 7-8 Mothers Day Weekend Spectacular
– Port Macquarie, NSW

May 13-15 Orchids Out West
– Hawkesbury, NSW

June 10-12 Diamond Festival of Orchids
– Nambour, QLD

June 25-26 Mingara Orchid Fair & Show
– NSW

June 30-July 2 Parramatta & District OS
Winter Show
– Winston Hills Mall, NSW

July 9-10 Tinonee Orchids Open Day & Show
– Tinonee, NSW

July 31 Hills District Orchids
– Winter Open Day
– Northmead, NSW

August 19-21 St. Ives Orchid Fair
– NSW

August 26-28 Melbourne Orchid Spectacular
– VIC

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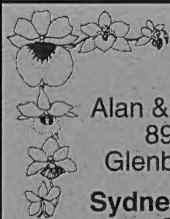
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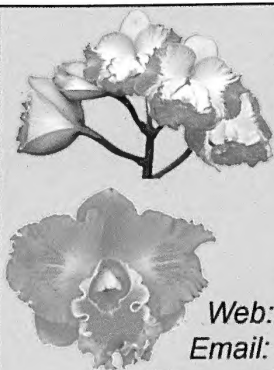
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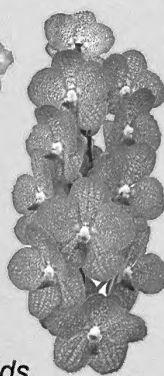
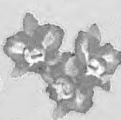
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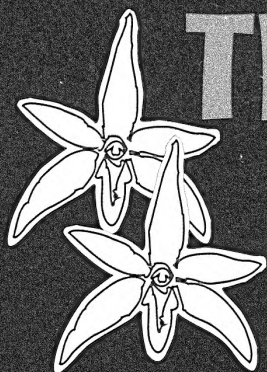
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May 13-15Orchids Out West - Hawkesbury NSW
June 10-12Diamond Festival of Orchids - Nambour
June 25-26Mingara Orchid Fair & Show
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